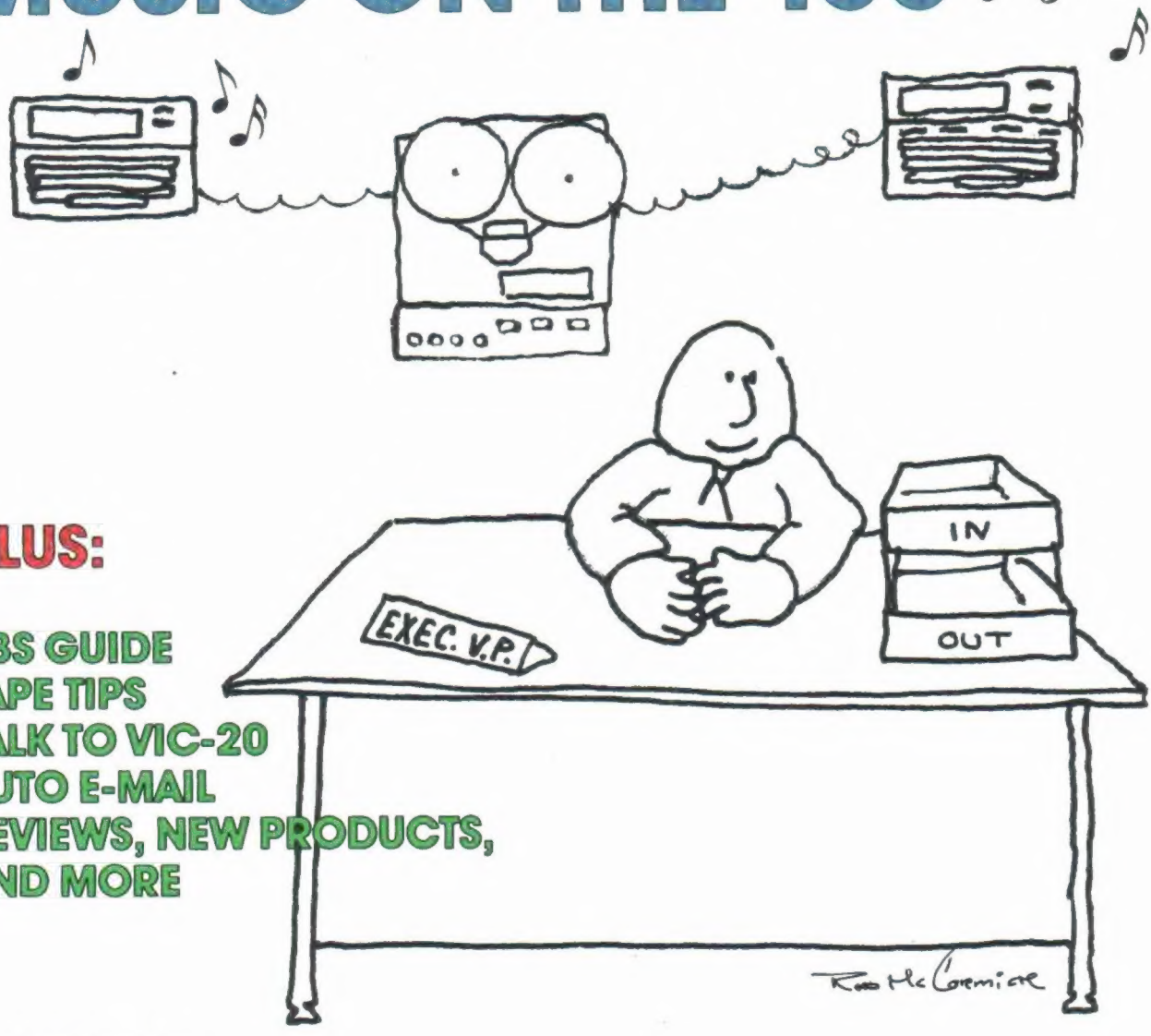
PORTABLE 100

The magazine for Model 100* users

NOVEMBER
1983
$2.95

MUSIC ON THE 100 ♪ ♩



PLUS:

BBS GUIDE
TAPE TIPS
TALK TO VIC-20
AUTO E-MAIL
REVIEWS, NEW PRODUCTS, AND MORE

0 71486 02601 11

When it comes to superior performance, we study our lines very carefully.

Superior printer performance is not a fluke. It evolves from analyzing printed line after printed line. Taking the time to test and retest. After 30 years of manufacturing precision parts, we know that there are no shortcuts.

And so we took the Gemini-10X and methodically put it through its 120 cps pace. We achieved a print head life of over 100 million characters with an extremely precise dot alignment creating each crisp character.

So far so good.

Next, sophisticated performance demanded versatility. A wide choice of character sets, a buffer expandable to 8K, and the ability to interface with all popular personal computers. We added macro instruction, giving Gemini-10X the capability to perform up to 16 operations with one command. We included as standard a paper feed system that has a friction and fully adjustable tractor feed. Then we even built in the dexterity to print graphics and text on the same line.

Done.

And, of course, staying the best means constant reviewing and fine-tuning. Keeping the Gemini easy to find, easy to afford and so reliable it can be warranted for up to twice as long as its major competitors.

Only the most careful engineering has built the new hard-working Gemini-10X. You'll applaud its performance.

star™ micronics·inc

THE POWER BEHIND THE PRINTED WORD.

Computer Peripherals Division
2803 N.W. 12th Street, Dallas/Ft. Worth Airport, TX 75261

$309

Plus $10. for shipping and handling.

QUALITY SOFTWARE AND PERIPHERALS FOR YOUR COMPUTER

4510 W. Irving Park Rd., Chicago, IL 60641

Skyline MARKETING CORP

MIKROKOLOR

Color Graphics Inferface

High Resolution Color and Full Screen Video Comes to the TRS-80 Model 100!*

The MIKROKOLOR Color Graphics Inferface is designed to provide the new TRS-80* Model 100 portable computer with high resolution color graphics and text capability, utilizing a standard color television or color monitor. The MIKROKOLOR provides 256 x 192 color graphics, with 15 colors plus transparent. Its 3 dimensional Sprite planes provide for simultaneous disply of all levels. It has four modes of operation available.

1. Test mode: Provides 24 lines of 40 characters each using a 6 x 8 dot matrix, and provides 256 user defineable characters.
2. Multicolor mode: Provides 64 x 48 color graphics.
3. Graphics 1 mode: Provides 256 x 192 color graphics, 24 lines of 32 characters each, utilizing an 8 x 8 dot matrix, with 2 colors per character.
4. Graphics 2 mode: Provides the same as Graphics 1 mode, except allows 16 colors per character.

Sprites are prioritized 3-D slide planes, 32 in all, capable of displaying 15 colors plus transparent. This allows easily programmed graphics animation capability for use with business displays, graphs, charts or games. Unit provides Composite Video output for use with any color television when employed with a modulator, or by direct connection to a color monitor. Use with a black & white television or monitor allows 16 gray levels to be used instead of colors. No hardware modification is necessary to your set, as the unit plugs into the existing buss expansion socket. The Texas Instruments TMS9918A Video Display Processor uses no memory from your set, it has it's own on board RAM. Other models supported are S-100, TRS-80 Models I, III, 4 and 12 and Apple II. For information on use with other models, send complete buss information and method of addressing with a large SASE to our technical department, P.O. Box 5686, Vandenberg, California 93437. Bare boards are also available for universal adaptation to almost any 8 bit system.

The Model 100 Mikrokolor will come complete with manual containing sample programs. Also available will be a text translation program that will provide full screen text capabilities of 24 lines of 40 characters a line, with full cursor and scroll functions. VHF Modulators are available also at $54.00 including cable (powered by Mikrokolor unit). These operate on channels 7-10 VHF.

The Mikrokolor is available at the introductory price of $235.00 for assembled and tested units, or $195.00 for kit of all parts. Both come with full documentation. User Manual only $5.00. Money order, COD, check or credit card. Personal checks must clear. COD add $2.00. Visa, Mastercard add 4%. Cal. res. add 6% tax. Custom installations are priced individually, on a case-by-case basis. Introductory prices good until December 25, 1983. Reg. Prices $335.00/$295.00. Order from:

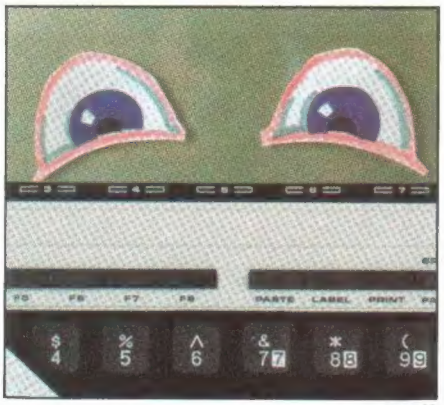
Andreasen's Electronics Research & Development, Inc.

1548 Monterey Street • San Luis Obispo, CA 93401 • 805-541-6398

See cover article to 80 Micro, May '83 for additional info.

*TRS-80 is a trademark of Tandy Corporation.

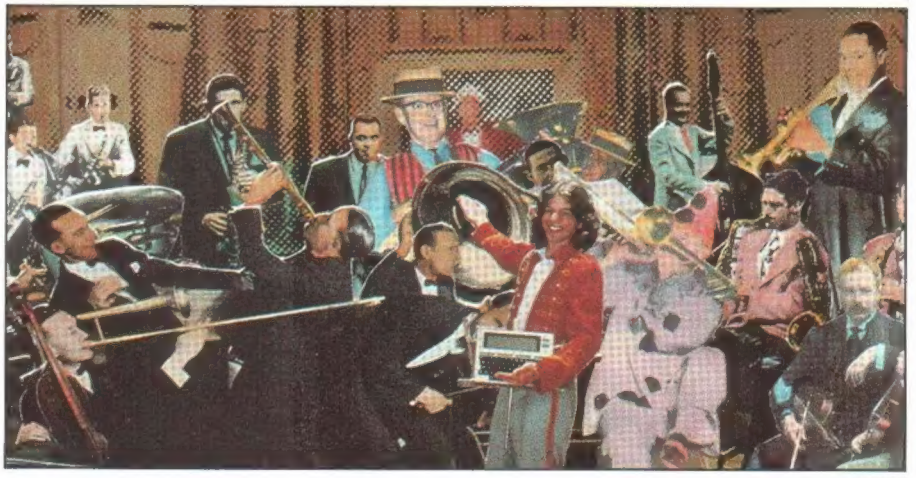
Circle No. 2 on Reader Service Card



page 40

PORTABLE 100

DECEMBER 1983
VOL.1 NO.3



page 24

FEATURES

24
TRANSFORM YOUR PORTABLE INTO A MUSIC MACHINE
By Joel and Debra Dinda
Your Model 100 should not be taken for a musical instrument. Or should it?

40
A USER'S GUIDE TO BULLETIN BOARD SYSTEMS
By Jim Cambron
The nation's major bulletin board watcher takes you on a tour of BBS America.

ARTICLES

16
MAKING SOME OTHER MICROS SPEAK MEWS
By David Busch
When it comes to writing programs, the 100 has some limitations. If you have a second computer, there's a way around them.

22
TAPE TIPS OR KEEPING SANE WITH CASSETTES
By Don Watson
CLOAD has five letters, but to many of us it's a four-letter word.

34
AT THE SUPERMARKET
By Margery Eliscu
Columnist Eliscu's suspicions about computers are confirmed at the checkout counter.

DEPARTMENTS

4 PREVIEW
8 MAIL.100
11 THE WIRE
51 FULL-DUPLEX
By Terry Kepner
54 REVIEWS
60 NEW PRODUCTS
64 END TRANSMISSION

page 16

COLUMNS

14 TANDYTALK
Of meetings and flights, poundings and Junebugs, Martina and bar codes.
By Bill Walters

20 PORTABLE COMMANDER
Jake offers some new commands to counter the perils of portability.
By Jake Commander

36 BUSCH LEAGUE
Strike up a Kegler's den inside your100.
By David Busch

46 TELECOMPUTING
Turn your Model 100 into an automatic mailman with this CIS offering.
By Bill Louden

PORTABLE 100 is published monthly by The Computer Publishing Company, Inc., Highland Mill, Camden, ME 04843. James S. Povec–President, Michael Perlis–Executive Vice President, H. John Delile–Treasurer

Subscriptions are $28 for twelve issues. User Group subscription rates available. Outside U.S.A. add $10 for extra postage. Dealer inquiries: Send to Marian Savage, P100, Highland Mill, Camden, ME 04843. (207) 236-9621.

POSTMASTER: Please send changes of address to Portable 100, P.O. Box 468, Hasbrouck Heights, NJ 07604. Application for mailing at second class rates pending at Camden, Maine, and additional mailing offices.

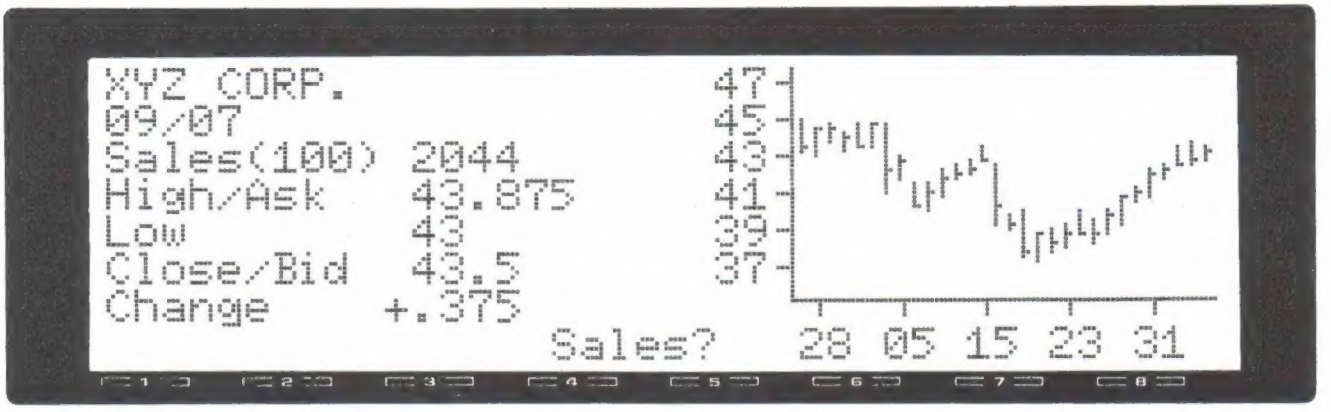
ISSN 0738-7016

Cover design by Rod McCormick

INTRODUCING

TELE-STOCK™

for TRS-80 Mod 100*



TELESOFT announces the release of TELE-STOCK, a Stock Market Inquiry, Analysis, and Portfolio Management System developed for the TRS-80* Model 100.

Designed to assist the investor in making good management decisions, TELE-STOCK uses the Auto-dialing Modem and Real-time Clock features of the Model 100 to automatically call the Dow Jones News Service at a user specified time each business day, and retrieve market activity on user defined stocks. For those who travel, the system also supports the Acoustic Coupler from Radio Shack*. Log-on and retrieval of data is completely automatic.

Retrieved data automatically updates history files for each stock which are then used to display and print the latest market activity, along with historical graphic presentations of HIGH, LOW, CLOSE and VOLUME. Return On Investment calculations are also provided.

TELE-STOCK provides more complete and meaningful data (12 to 24 hours earlier) than available from the newspaper.

The cost of the daily service, this software and even your TRS-80 may be tax deductible when used for this purpose (consult your tax advisor for details).

IMPROVE YOUR INVESTMENT PERFORMANCE
for only $59.95 (Ca. residents add 6% tax) on cassette with manual.
Send check, money order or VISA/MC number with expiration date to:

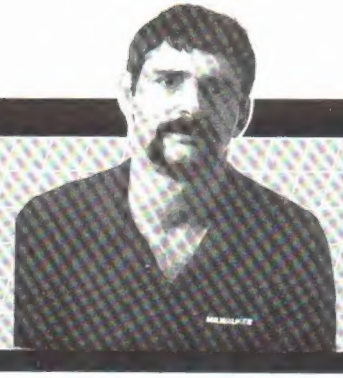
TELESOFT™
P.O. Box 6398
Thousand Oaks, Ca. 91359
or call 805/499-6271

*Requires 24K Model 100 with direct connect or acoustic cable. *TRS-80 is a trademark of the Tandy Corporation.

Circle No. 3 on Reader Service Card

JOHN P. MELLO JR.

PREVIEW



CAN HANK WILLIAMS DEPROGRAM THE DAMAGE OF TI AND BILL COSBY?

I was visting my parents, soaking up the Swansea sun, and writing on the patio with my 100, when my father asked me if that gadget under my fingertips was "one of those Texas Instruments things." I haughtily replied, "No. It's a Radio Shack." Dad seemed disappointed with the answer and went back to his gardening. I thought about his reaction for a minute. What could I do to wipe out the damage Bill Cosby had done? A rousing Country-Western tune would've helped, but all I had in my MEWS at the time was a calc clone. Oh, if I only had Joel and Debbie Dinda's Music Machine in there.

Joel and Debbie, a brother and sister combo from Michigan, have spent a lot of time exploring the music capabilities of the 100. They've devised a notation system for writing MEWS music and a program to play it. They warn Model 100 owners Tandy's lapper's no musical instrument, but after trying their program (page 24), see what you think.

BULLETIN BOARDS. Most of us know about "The Big Boards" — CompuServe and The Source — but many smaller bulletin board systems exist offering services just as valuable as the biggies. And most of the small boards are free.

A prominent tracker of these "way stations of the Network Nation" is Jim Cambron, publisher of *The Online Computer Telephone Directory.* Alfred Glossbrenner in his fine book *The Complete Handbook of Personal Computer Communications, Everything You Need to Go Online with the World* says of Cambron's directory:

"[T]his is *the* directory of available CBBSs. Cambron takes great care to verify each and every one of the 450 or more numbers he publishes. He has written special software that enables his TRS-80 to automatically dial each number on the list. If the system does not receive an appropriate answer, the number is removed from the directory."

Starting on page 40, Jim talks about different bulletin boards systems and outlines some generic commands used by most of them.

CLOAD WOES. Until hardware developers introduce another storage medium (a devlopment in the near future if Holmes Engineering's wafer drive is any indication), Model 100 owners will have to weather the rigors of CLOADing.

According to Don Watson (page 22), there are five common causes to CLOAD failures. He tells you what they are in his "Tape Tips or Keeping Sane with Cassettes." And he also tells you how to avoid them. Try some of his suggestions and see your tape loads improve.

HUMOROUS VEIN. Many computer magazines have written about the utility of portability, but few have considered its perils. Jake Commander (page 20) has ruminated on these dangers and suggests some tongue-in-cheek additions to the 100's Basic to cope with them.

Unlike Jake, Margery Eliscu (page 34) views computers with a touch of trepidation. Maybe that wouldn't be the case if she met a 100 face-to-face, but that's beside the point. Her amusing, but provocative anecdote will make you laugh, but also wonder about a society becoming increasingly dependent on computers to conduct its activities, even one as mundane as going to the supermarket.

So read on, while I download Music Machine and try to get it to play some old Hank Williams tunes.

A WORD ABOUT LISTINGS...

Packed program listings have been a bane for us for a long time. Granted, packing lines is necessary to make Basic run faster, but it can be hell when you're trying to figure out how a program works. For you newcomers, a program line may be made up of several program statements separated by a colon. So when you're going through a listing in *Portable 100,* keep the following in mind.

When you see a line like this:

```
830 PRINT
    :PRINTTAB(2)"IT TOOK YOU ";DM;"
    MIN. AND ";DS;
```

It should be typed like this:

```
830 PRINT:PRINTTAB(2)"IT TOOK YOU ";DM;"MIN. AND ";DS;
```

This may be a little confusing for the novice, but you'll soon see it makes the listings easier to type into your 100 and easier to understand how the programs work.

—The Editors

From the people who brought you...

BUSINESSPAK+

Five NEW programs

designed for the businessperson. Each on its own cassette with manual.

First with software for the Model 100

You have made BUSINESSPAK+ an overwhelming success! Now, we are introducing **five new programs** for the Model 100.

PCSG continues to be first in innovative programming for the businessperson using the TRS-80 Model 100 Computer.

Look at these five new programs.

DATA+ $59.95

With DATA+ the Model 100 becomes virtually a true data base. You can input data rapidly from a 16 field screen that you make yourself like our PUT+. Here is the difference:

REVIEW / Using function key 1 you can recall any record, by searching any field.

EDIT / Change or update any record you select, instantly on the screen.

LIST / Using function key 5 you can print address labels, list records or selected fields of records in columns or other configurations. You can even pause, and reset left margins.

MERGE / Function key 6 lets you merge. You can automatically print any fields of any records into forms or letters, wherever you designate. With all four of these functions you have full search and selection capability.

With **LIST and MERGE** you can remember your favorite formats, quickly defaulting to them by simply depressing the ENTER key. The added feature BUILD lets you build and print a file of unrelated records that could not be selected either alphabetically or numerically.

On cassette with excellent, easy to understand manual.

TYPE+ $59.95

The Model 100 now becomes, with the addition of any printer, the finest, most feature rich, electronic typewriter available today. You can type directly to the paper. (Some printers have a one line buffer.)

SCREEN BUFFER / To allow you to edit before printing, you can control the screen buffer from 1 character to the last line.

CENTER / Center on / center off controlled with function keys.

MARGINS / Set margins with function keys. Audible end of carriage, automatic carriage return and function key Tab Set.

DIRECT CONTROL / If your printer responds to backspace commands, you can backspace and overstrike. Paper advances with carriage return.

With TYPE+, everything you print is stored simultaneously in a RAM file, formatted as you composed it. You can reprint instantly, or edit it in the file. On cassette with excellent, easy to understand manual.

TUTOR+ $29.95

Learn keyboard skills by playing a delightfully exciting game. While experiencing the thrills of a space invaders type game you become proficient at manipulating the keyboard. A game that forces you to learn touch typing, utilizing all the keys. On cassette with excellent, easy to understand manual.

PCSG provides hotline software support for the Model 100. Give us a call at 1-214-351-0564.

SORT2+ $29.95

You can sort a file in place with SORT2+. It consumes only 1k free memory, while sorting file in RAM you entered with PUT+ or DATA+. Our original SORT+ allows you to sort from cassette, but requires more memory while sorting. SORT2+ is for those times when memory or cassette sorting is a problem. SORT2+ also has upper case fold, and true numeric field sort. On cassette with excellent, easy to understand manual.

TENKY+ $59.95

With TENKY+ the numeric keypad on your Model 100 emulates a ten-key desk calculator, but better. The right side of the screen represents the tape, which can be filed and/or printed. Three memories are visible on the left side of the screen, to be recalled with the touch of a key. TENKY+ gives you all the normal functions of a desk calculator, plus up to 26 character annotation of any item, amoratization, IRR, future value, effective interest rate, depreciation and present value. On cassette with excellent, easy to understand manual.

Portable Computer Support Group is pleased to offer these program additions. We endeavor to continue as *The Leaders in Software for the Model 100.*

TRS-80 is a trademark of Tandy Corporation.
©1983 Portable Computer Support Group

PCSG

PORTABLE COMPUTER SUPPORT GROUP

11035 Harry Hines Blvd. No. 207, Dallas, TX 75229

Circle No. 4 on Reader Service Card

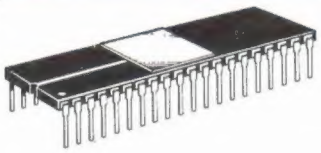
MASTERCARD / VISA / COD

8K RAM MEMORY MODULES

EXPANSION RAM FOR TRS-80
MODEL 100 PORTABLE COMPUTER

$64.95 EACH
3 OR MORE $59.95 EACH

△ EXACT REPLACMENT
△ EASY TO INSTALL
△ INSTALLATION INSTRUCTION INCLUDED
△ HIGH QUALITY MANUFACTURING
△ WARRANTY INCLUDED



PG DESIGN ELECTRONICS
66040 GRATIOT
RICHMOND, MICH. 48062
313-293-6639

DEALERS INQUIRIES WELCOME
TRS-80 is a trademark of TANDY CORP.

Circle No. 5 on Reader Service Card

PRACTICAL APPLICATIONS for the MODEL 100

PRINT Provides your Model 100 with advanced word processing features — Automatic 'new line' eliminates split words at end of line, full margin control with right justification, page numbering, automatic pagination, forced 'new page,' pause between pages, line centering, double spacing and more! Also supports multi-column printouts on most printers. **PRINT $49.95**

SIZE Useful program to perform checksum for positive verification of modem transmissions. Also reports length of file in number of lines and total bytes. **SIZE $9.95**

QUIET Not a program, but a simple and useful modification to your Model 100 keyboard to greatly reduce key click. Full instructions included. Does not void Radio Shack warranty. **QUIET KEY $4.95**

COPY Multi-purpose file routing utility allows file merge or duplication. Output may be directed to screen for viewing or to other devices. Very useful in phone communications. **COPY $19.95 cassette**

This is just a sample of what is available from Micro Computer Services. A full catalog will be shipped with every order.

Micro Computer Services
P.O. Box 17586
Portland, OR 97217
(503) 285-7424
Visa and Master Card welcome

Circle No. 6 on Reader Service Card

PORTABLE 100 The magazine for Model 100 users

Editor
Kerry Leichtman

Managing Editor
John P. Mello Jr.

Production Manager
Lynn Rognsvoog

Senior Technical Editor
Curtis P. Feigel

Technical Editor
Jamie Tietjen

Contributing Editors
Jake Commander, David Busch
Terry Kepner, Bill Louden
Bill Walters

Ad Production
J.L. Patterson

Art Production
Susan Cramer, Claudia Diller
Rod McCormick

Publisher
James S. Povec

Director of Marketing
Carl Cramer

Advertising Director
Peter Montross
(207) 236-9621
Highland Mill
Camden, Maine 04843

Advertising Scheduler
Caron L. Taylor

Circulation Director
Lori Hellevig
Loriel Peters, Assistant

Bulk Sales
Marian Savage

Projects Director
Michael Federle

Controller
John Delile
Pam Gertner, Assistant

Office Manager
Bonnie Hellevig

Typist
Nancy Laite

©Computer Publishing Co., 1983. All rights reserved. Contents of this magazine may not be reproduced in whole or in part unless expressly authorized in writing by the Publisher. TRS-80 and Model 100 are trademarks of the Radio Shack Division of Tandy Corporation.

This magazine is published by Computer Publishing Company who is solely responsible for its contents.

The Publisher assumes no responsibility for the return of unsolicited manuscripts, queries or artwork. Materials submitted to Portable 100 should be accompanied by a stamped, self-addressed envelope. Editorial offices located at Highland Mill, Camden, ME 04843.

U.S.A. Newsstand distribution by Curtis Circulation Company.

Where electronic banking brings you timely information in virtually no time at all.

From cash management to information management, the Citi of Tomorrow brings unprecedented speed and accuracy to your company's operations.

For example, in the time it takes to read this line, electronic banking can speed funds transfer instructions from New York to Tokyo. Or anywhere else. At any time.

The secret? The largest financial telecommunications network of any bank anywhere. Including over 2,300 worldwide offices and our own communications satellite channels.

For a fact-filled electronic banking brochure, call your local Citibanker or write to: Citibank, Electronic Banking, 399 Park Avenue, New York, NY 10043.

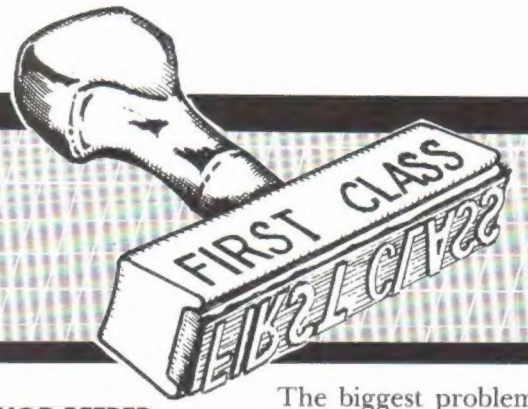
CITIBANK CITICORP®
GLOBAL ELECTRONIC BANKING

Circle No. 37 on Reader Service Card

© 1983 Citibank, N.A. Member FDIC

The Citi of Tomorrow and Global Electronic Banking are service marks of Citibank, N.A.

MAIL.100



Editor's Note: In addition to letters from our readers, we also include in Mail.100 bits of information of interest to our readers from CompuServe and The Source. Those message writers are identified by their CompuServe (CIS ID) or Source (STC ID) identification number.

NICADS NO SOLUTION FOR THIS 100 USER

I had problems getting contact in the battery case with nicad batteries and had to do what Mr. MacCarthy detailed in his letter in the September issue (but it didn't take me anywhere near 90 minutes!).

Anyway, I found the effort to be a waste of time! In my experience with new Radio Shack AA 1.25-volt rechargeable nicad batteries, after a full charge they only held out for two days of moderate use in an 8K machine with no external devices and far worse, when they started to go, they went so fast the low battery LED only turned on for several seconds before my Model 100 shut down. This situation did not improve after several charging cycles.

I find that alkaline batteries and the AC adapter satisfy all my power needs; the possible money savings in using nicads is offset by their poor performance and the tedious and possibly harmful surgery required to get them to work at all. For those who use their Model 100 heavily away from AC power, Wayne's lantern battery is probably the best, if perhaps unorthodox, solution.

By the way, congratulations on the maiden issue! It was the best first issue of any computer magazine I've seen yet.

Alexander Benenson
585 West End Avenue
New York, NY 10024

NEITHER BITSTER NOR BEEPER NOR HACKER NOR CHIPSTER

Let me be one of the first to write to you. One thing that troubles me about the terminology in this business is the word "computerist". I will accept the person who plays games on and with a computer is a computerist. I would like to start a movement for the person who writes the games and programs for a computer to be called a "computor."

Lyndon B. Mitchell
94-1041 Mahua Place
Honolulu, HI 96797

PRAISE FOR RAMELLA BUT NOT FOR HIS LISTING

Richard Ramella's article and program "Format Your Words With This Text Aid," in the September issue was just the ticket I needed yesterday. My husband complained that he couldn't get near the bigger computer for word processing in his own office. I remembered the article and thought it might make a Model 100 more useful to him.

We had been using the Model 100 primarily for travel. Copy written on it was transmitted via Ma Bell to a TRS-80 Model III back in our office for storage on a disk. Then the material was formatted for printing with Scripsit by our secretary since the Model 100 did not read many format instructions. After transmission, the copy could be killed off the Model 100 to free up the space for more out-of-town work.

Because the process was time consuming, we rarely used the 100 at home.

Although I have never done any programming before, the well-detailed article got me past several stumbles and today the little program is making the 100 useful to him. Thanks.

The biggest problem I had with the program came not from Mr. Ramella's instructions, but from the magazine type-face. It is so difficult to tell whether a space is intended or not with the stylish but hard-to-read typeface. My eyes were swimming by the time I finished. Your instructions on page four aren't completely helpful either. Sometimes a break at the end of the line meant a space; sometimes, it did not.

Since the article was seemingly meant for novices, please give us all the help you can. Next time, try another typeface for ease of legibility, *please*.

Carrie Arnold
2221 South Fillmore St.
Denver, CO 80210

When we designed *Portable 100*, we believed the typeface we chose for our listings (Avant Garde Book) would make our listings easier to read than the photostats of dot-matrix and daisy-wheel; listings published in other computer magazines. If more readers agree with Carrie, then we'll end our grand experiment with typeset listings.

A FRIENDLY DISAGREEMENT WITH JAKE COMMANDER

Do we own the same computer? I am afraid I am slightly confused about your article on the ROM Basic addresses in the premier issue of *Portable 100*. Actually everything was fine until I got to TAB. From then on every address was different, including some functions which I didn't expect would have multiple interpretations (i.e. PEEK, ASC, CHR$, SPACE$). MID$ even wanders off to FB00 in RAM. What gives?

To be fair, however, I am definitely a neophyte when it comes to disassembling code and have not really reached the point with my software

tools where I can trace much of anything. What could really be a help is a memory map and the different areas you can patch in and out of ROM. Don't ask for much do I? I am hoping that things like this will show up in future issues.

One little side note — it would be nice to show the decimal value of addresses as well as the hex as all the CALLs, PEEKs, and POKEs need decimal.

The only problem I have with the 100 is the sequential file structure they decided on. To update a record in a file either for deletion or modification you essentially copy the contents of one file to another. This to me can be a real waste of RAM. I thought master-update files went out when on-line storage came in. I really can't see why Microsoft-Tandy didn't support insert-delete structures in Basic for RAM. They do while in TEXT(i.e. cut, copy, paste).

I really can't complain about Radio Shack's support thus far. After calling Texas for some support, they sent along some handy, dandy addresses in the ROM and RAM. Although some of the addresses are parallel to Basic keywords some are quite handy to know. For example:

423F locks LCD displaying scrolling;
4244 unlocks LCD;
4269 sets the reverse character display;
426E turns off the reverse character display;
FE00 is the start of LCD memory;
FF40 is the end of LCD memory; and
F962 marks the start of the file directory.

Each file is managed by an 11-byte directory entry:

Byte 1 = directory flag word;
Byte 2,3 = address of file;
Byte 4-11 = filename;
Bit 7 (msb): 1 if valid entry;
Bit 6: 1 for a DO file;
Bit 5: 1 for a CO file;
Bit 4: 1 for a ROM file;
Bit 3: 1 for an invisible file;
Bit 2: reserved for future use;
Bit 1: reserved for future use; and
Bit 0: internal use only.

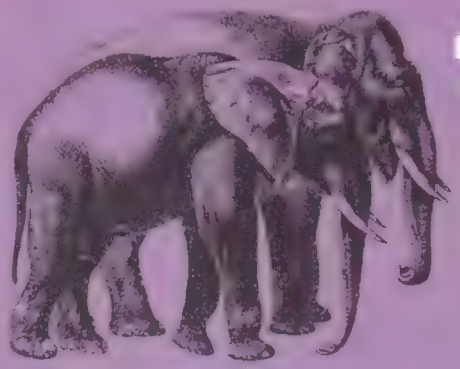
One thing to pass on to my fellow neophytes: When looking up the file address, the location in memory for the file is byte 3 + 2 not 2 + 3. This is true of all the jump addresses I have found. If the address reads 11 + FF with a PEEK and a PEEK+1, better use FF+11 or you ain't gonna get there from here. Also don't forget to multiply the MSB by 256 and then add to the result the LSB or you won't get there either.

All in all I think you've started a good magazine and given the way Radio Shack has been selling the 100, a good future also. Best of Luck!

James R. Swarr
84 Dean Ave.
Franklin, MA 02038

Your analysis of the ROM addresses goes awry at TAB because you surmise the keywords that are functions are located in the same table as the commands. As I stated in my article "there is a second table at location 004E in the ROM. This con-

INCREASE THE MEMORY OF YOUR MODEL 100



IN MINUTES WITH
PURPLE COMPUTING
MEMORY MODULES

We Make Expansion Easy!

- Each memory module offers you an additional 8K. Add 1,2, or 3.
  - You can increase your present memory capacity up to 32K in a matter of minutes.
- Easy installation, with just a screwdriver, and no electronic knowledge required.
  - **Save time . . . your computer never leaves home!**
  - **Save money . . . competitively priced & no installation charge!**

Purple Computing guarantees full satisfaction and ease of installation or return within 90 days for a prompt refund.

$69.95 8Kx8 CMOS RAM

Special Offer
(with purchase of a memory module)
Centronics Model 100 printer cable - $11.95
No frills direct connect Modem Cable - $9.95

PACK A PURPLE MODULE IN YOUR COMPUTER

Purple Computing • 4807 Calle Alto • Camarillo, CA 93010
(805) 987-4788

Product	Quantity	Cost
8K Memory Module		$
Printer Cable		$
Modem Cable		$
	CA. Residents only, 6% tax	$
	Total Cost =	$

Price includes postage & handling. Shipped from stock.

check
money order VISA MasterCard Acc't. # Exp.
Signature
Name
Address
City State Zip

Circle No. 8 on Reader Service Card

tains many addresses used in the evaluation of Basic math functions and expressions. These are extracted and jumped to in a similar fashion to the first table." In your analysis of the keywords, you ignored this second table and acted as if all the words were in the first table. Even using the two tables, you will be unable to extrapolate all the keywords because, as I pointed out in the article, some functions have more than one syntactic use. The address for these words will vary depending on their context.

Jake Commander

BROADCASTER SEES 100 AS WAVE OF FUTURE

Portable 100 is a magazine I will be looking forward to every month, good luck with it!

I am fairly new to personal computing and purchased the Model 100 from my brother who is a computer marketing representative for Radio Shack. I had decided to purchase a personal computer to further my horizons (and for fun) in my field of professional recording and commercial broadcasting. I work full time for NBC radio (WKYS-FM in Washington, DC) and run my own recording studio and maintenance company, (so my time for a hobby is quite limited).

I had been shopping around for a couple of months learning my way around "the computer jungle." I decided that for a learning tool, a low cost machine was the best bet. Then my brother told me of this great new Portable 100 that his store had just gotten in. I had visions of an overgrown calculator, couldn't have been less interested. Until I saw it! Wow! But the price...Ugh (I own the 24K model). However, after weighing the difference in cost of an expanded VIC-20 or Color Computer system plus the 100's portability (and 20 percent employee discount)...well....now I shlep it with me everywhere and use it in my business and personal doings everyday. This machine is truly the wave (way) of the future!

Remy David
CIS ID 75745,740

A TRICK TO ADJUST THE DAY OF THE WEEK

When I change the date using DATE$ in Basic, it doesn't update the day of the week display on the main menu. I have written a program that moves the menu day of the week display forward by as many days as you wish. It will set your clock back one second for each day you change.

```
10 D$=DATE$
20 INPUT "MOVE FORWARD HOW
   MANY DAYS?"
30 T$=TIME$
   :TT$= "23:59:59"
40 FOR DD=1TOD
   :TIME$=TT$
45 IF TIME$=TT$
   THEN 45 ELSE
   NEXT DD
50 TIME$=T$
   DATE$=D$
```

Don Corbitt
CIS ID 75655,1516

MODEM TARIFF ISSUE HEATS UP ON COMPUSERVE

In the past few days, several of us have been discussing the proposed modem tariff of Southwestern Bell, which, if approved, could spread to other local Bell operating companies (see *Portable 100*, October 1983, page 64). Some of you have suggested a letter-writing campaign to state public service commissions. I think this is a good idea....

Since I manage a Congressional office and work in political campaigns and deal with mail campaigns, let me offer a few suggestions:

- A well-written, polite letter goes a long way, but a handful of good letters does not have the impact of several bags of cards and letters. Eloquence is nice, but nothing beats volume. This year's campaign against the 10 percent withholding of interest on savings accounts was orchestrated by banks and flooded Congress with cards and form letters. Our office received more than 20,000 and very few of them were personally written. It was the volume, not the style of the letters, which got the message across.
- Make sure the public service commission will hold public hearings on your phone company rate case and pack the hearing with witnesses for the cause. Make sure the witnesses furnish the commission with typewritten texts of all testimony. Public hearings are where it pays to be polite and articulate. Don't be put off by fear of not being allowed to testify. Most public service commissions are required by law to allow any citizen who wants time to testify.
- Expand your letter-writing campaign to state officials, both in the legislature and the state house. Most public service commissions are appointed by the governor.
- Make friends with your local phone company manager. I have found many of them own personal computers and have modems. They don't pay for their home phone service, but they can still become an ally.

Doug Thompson
CIS ID 70775,315

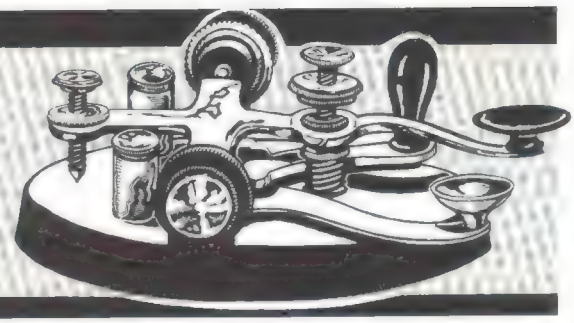
The Congress has held hearings on, and is about to consider legislation which deals with the fact that one of the effects of the Justice Department-AT&T consent decree may be to increase rates to the extent that many may be driven off the system. I am chief counsel to the House Committee on Energy and Commerce, which is the chief conduit for such legislation.

I have asked a very bright lawyer, who works for the committee, to take a look at this issue and tell me, and us, if this is the kind of issue which should be handled by national legislation. If so, we may be able to include some language which will discourage differential rates for any kind of communications medium.

Why should binary digits, which come from machines, be treated any different than binary digits which come from humans?

Frank Potter
CIS ID 70220,340

THE WIRE



FIRST TIMERS GETTING 100S AT COLLEGE IN TANDYLAND

By TOM JUERGENS

Dallas Baptist College, deep in the heart of Texas' electronics belt, is committed to graduating computer literate students. This year, as part of that effort, the college required each of its 500 or so entering full-time freshmen to buy TRS-80 Model 100s for use in class. As far as the college and Radio Shack (by Texas standards, a mere stone's throw away in Fort Worth) know, Dallas Baptist is the first American campus where every freshman is a computer user.

A concurrent requirement at the college is that already-enrolled students with at least four semesters left before graduation must use some kind of computer, be it their own, a friend's, or one of the school's. For the past two years Dallas Baptist has required students to take basic computing classes, and this year offered an orientation in the 100's operation.Yet according to both administration and student sources, the literacy program and the freshmen requirement are big issues on campus.

TURNED IN DROVES. Melanie Carstarphen, a senior and this year's Student Government Association president, worked on the registration team last summer and saw would-be freshmen registrants, particularly those in their 30s, 40s, and 50s, turn away "in droves" when they learned of the computer use requirement.

"By no means," countered computer science professor William Moos, who's been involved in the launching of computer literacy at the college for the past couple of years. "Our enrollment has been going up every semester and I have no indication that it's off." Sure, Moos agreed, there was "some drop off" in enrollment that's attributable to the new policy, but the number of registrants and students in all classes who decided not to attend the college this year is less than 200.

TRADE OFF. Dr. Marvin W. Watson, president of the college, said his guess of the number of first-time students deciding not to attend this year because of the computer literacy requirement was around 100. Most of them are older than traditional first-timers, he noted. Balancing the drop-out rate, he added, is the attraction the literacy requirement had for students who otherwise would not have attended the college.

Student reaction to mandatory computer literacy is "really mixed" among those who see it as an excellent opportunity and those who see it as "an extra expense and requirement they shouldn't be forced into," according to Suzanne Croce, the college's director of news services and editor of the administration-run school newspaper, *The Chieftan.*

"Students want to be sure they're all in the same boat," said Moos of the student body's mood. "Freshmen must buy their computers but since upper classmen are required to use computers and must either buy them outright or rent them from the school's computer lab, everyone's on roughly the same footing there.

MOST PRO-COMPUTER. About 75 percent of the freshman class is "pro-computer," Carstarphen guessed. But in that group and among upper classmen as well are students who resent having to use computers for other than financial reasons.

"We are a Baptist College, and a great deal of the students are religious education and management majors," she said. And many of them, together with other students pursuing majors that will lead them to work "directly with people" feel computer literacy is something they can do without. There is also some "fear of dependence" on computers on campus, she added.

However, computers are "coming to management and onto teachers' desks and, so, closer to the average office worker," said Moos, which is a big reason why computer literacy is "invading all areas of study" at the school. "We're hoping students will learn to become more efficient while in school," and that that efficiency will give them a productive and competitive "edge" in the business world. And the only way to beat compuphobia, Moos added, "is by regular use."

COMPUPHOBIA. Compuphobia races hardest, of course, in the veins of older students. The average age of the Dallas Baptist student is about 28, said Tom Thomason, the college's public relations man. Only about 300 of the 1400 students enrolled live in campus dorms, the rest are older commuters and night students.

The mandatory use of computers on campus was approved in June 1982, and the decision to use a "desktop" machine, as opposed to a "suitcase" machine, was made late that year, Moos said.

"We wanted something students could carry to class, and something that would be compatible with the largest number of courses, not just a scientific tool," he noted. The machine also had to have computation

and word-processing capabilities, and had to be user-friendly.

The Model 100 was found to be "pleasantly superior" in all respects, Moos said.

The 100 won the hearts of school's faculty and administrators over Texas Instruments' CC-40 and Hewlett-Packard's HP-75C. Neither has built-in word processing, Moos said.

The 100 "simply did the best all around job for the price" and "is far and away the best buy on the market at the moment. Most computers have a bug you have to work out. The 100 doesn't," he said.

COMPUTER-RICH AREA. Dallas Baptist doesn't have to look very far to see the advent of the computer age. Over a dozen schools in the Dallas-Fort Worth area use computer-aided instruction for remedial and gifted students from the third grade up, Moos said. And, according to Gary Haseloff of the instructional technology division of the state education department, Texas has been reviewing public school curriculums with an eye toward making recommendations on "essential elements" in education. While everything's still in the public comment stage, "it looks like computer literacy will be required for the junior high school level, probably in the seventh grade," he said.

The question still hanging is just what "computer literacy" is. But whatever it is, President Watson believes it's "not an option for the educated man or woman of the eighties — it's a necessity."

"Time will tell" how successful the literacy program is, Moos said.

BETTER THAN IBM. Editor Croce takes a 100 on news assignments and finds it "definitely a step better than using my IBM typewriter. "Granted, I can't see everything on the screen, but if I want to, I can take it home to write in quiet. It's very convenient," Croce said.

Carstarphen happens to be an English major who also enjoys working with the 100. She believes the literacy policy will "stick" and noted that a common scene around the student union is groups of people sitting around with 100s saying "well, let's try this" and "let's try that."

"I just hope nobody's tapping into the phone company or trying to find out what their grades are," she added.

OSBORNE FURLOUGHS: STRIKEOUT OR SHAKEOUT?

Adam Osborne pioneered the idea of taking-it-with-you computing, so he should benefit from the hot demand for lappers like the TRS-80 Model 100, right? Wrong!

While microcomputer firms everywhere rush to cash in on the hot portable market, the Prince Henry of transportables is on the verge of cashing out.

Early in September, Osborne Computer Corporation "furloughed" 80 percent of its staff, a move amounting to a near-total shutdown of operations, and a sign interpreted by some observers that the long-anticipated shakeout in the personal computer business had begun.

Osborne's official statement on the move acknowledged only a "cutback in operations" because of "the current economic climate...." And reportedly, the firm is readying a portable IBM PC clone. But as one furloughed employee told *Newsweek*, with no work force "it beats me how they're going to come out with a new product."

It's well known Osborne has been scrambling for months to find new money for his ailing business. Earlier this year, Osborne seemed ready to go public, but poor earnings in fiscal 1982 delayed the offering.

According to *Newsweek*, new management was brought in to shape things up for another attempt at going public, but Osborne's problems continued. Dealers, upset with the company's service system, sharply cut back orders in the first six months of 1983. Competitors like Kaypro and Compaq were cutting into Osborne's market. And this spring, when Osborne announced a new model, The Executive, before it was ready for shipping, orders for his Osborne 1 dried up, along with his firm's cash.

"It's tough to see a pioneer like Adam go through hard times," Chuck Peddle, president of Victor Technologies — a firm that lost

$11.1 million in this year's second quarter and had to lay off 600 employees — told *Newsweek*. "But there's going to be a continual shakeout. The market isn't going away. The question is how many and what kinds of machines will that market absorb."

HOME MICRO MARKET MEANS COMPUTER IN EVERY CLOSET

Many people buying computers for home management are shelving their micros, a trend hurting what the computer industry sees as the next great market — the home.

According to a syndicated report by the *Los Angeles Times*, the problem — after a person boils down all the talk of kilobytes and RAMs and ROMs and color graphics — is personal computers today do not make home life much easier, cheaper, or better.

A growing number of skeptics, the *Times* said, contend computers serve little, practical domestic need — and may not for a decade.

Richard Adler, a futurist and videotext consultant, told the California daily, "Rather than a computer in every home, I think more in terms of a computer in every closet."

According to the *Times*, analysts aren't predicting the home market will short-circuit completely. Most expect sales for the home — of both inexpensive small computers and more powerful personal computers — to continue growing for most of the decade. But the demand will be weaker than many companies expect.

Before the computer is truly domesticated, these analysts believe, it must become a much more simple and inexpensive link to the outside world: for banking, shopping, home security, energy control, news, and a dozen other types of information. Until then, most of the computers in the home — other than those being used for business — will be brought to satisfy curiosity, many quickly finding their way into storage.

Although the home-computer industry had record-breaking sales in 1982, when 1983 rolled in, store shelves were overloaded with the inexpensive home computers no one wanted. The computer industry, the *Times* said, had overestimated how quickly the demand would grow and underestimated how quickly the public would become too sophisticated for the machines, most only suitable for playing video games.

Those problems will be eliminated as early as this fall, computer companies argue, when they market more sophisticated machines. However, the *Times* noted some observers believe the new generation of home computer will not be enough to convince most Americans to plug in. Instead, they say, more substantial changes in technology are needed, a process that could take years.

THE CASE

FOR EVERY CASE

The **Chip-Tote™ PCD-1** by Kangaroo Video Products Inc., makes your TRS-80 Model 100 or Epson HX-20 truly complete. It's a compact, light-weight, foam padded soft case that doubles as a desk.

Businessman, Journalist, professional or hobbist — the **Chip-Tote™ PCD-1** provides the maximum in portability and protection for your computer and its accessories.

Kangaroo Video Products Inc. has been the leader in protecting T.V. cameras and video tape recorders for professionals worldwide. Now we have brought our thoughtful design and quality construction to the portable computer industry.

The **Chip-Tote™ PCD-1** features:

- Slim, handsome design
- Made of rugged Cordura® nylon
- Fully padded with Evazote closed-cell foam
- Non-scratch lining won't mar display screen
- Double-zip zipper for easy access
- Stand-up utility top holds papers upright for easy reference
- Pockets hold papers, notepads, business cards
- Detachable zippered pouch holds batteries, modem cord, acoustic coupler, AC adapter
- Convenient hand strap
- Comfortable adjustable shoulder strap
- Available in black or smoke gray

For more information contact: Kangaroo Video Products Inc., 9190 Manor Drive, La Mesa, California 92041
(619) 698-0230

KANGAROO VIDEO PRODUCTS INC.
WE SET THE STANDARD

Circle No. 9 on Reader Service Card

BILL WALTERS

TANDYTALK

OF MEETINGS AND FLIGHTS POUNDINGS AND JUNE BUGS MARTINA AND BAR CODES

Deadline again! And this month's going to be tough because we haven't reorganized since the last issue. Let's see. There's how I use the 100 to amuse a two year old, how that tennis player uses a 100 to play winning tennis, the 100's bar code reader, the annual meeting...

Aha! The annual meeting. There's a topic.

This time of year our management team from Fort Worth gets out and meets with every store, district, and regional manager. The whole management team goes, not just a few players, so everyone can hear what's on the field's mind. The point of the trip is to introduce the new fall line of merchandise, answer questions about any products either new or old, and to hear from our field management where we fouled up this past year. Yes, everyone goes, from chairman of the board right on down. Well, not *really* everyone — we left someone to answer the phones.

MULTIPLE UNIT FLIGHT. After the meetings, when we landed at Dallas-Fort Worth airport, the flight attendant welcomed Tandy back home. It seems about half the folks on our 727 belonged to Radio Shack. Quite a few Model 100s in use, too! And we didn't end up in Antarctica. It might have been the first multiple-unit, in-flight test of the 100.

TODDLER PROOF? I get asked many times what I do with my Model 100. My answer is really simple — "Everything." Let me count a few of the uses — notes in meetings, project tracking, appointments, "to do" lists, automatic phone-in update to Dow-Jones/News Retrieval for stock quotes, electronic mail via CompuServe when I'm traveling, a program to perform all pricing calculations, check inventory levels and stock movements, and of course, the ever present memo. I'm lucky though, Radio Shack hates memos even more than I do; our preferred method of business is to pick up the phone and call.

And then there's the most important use of all. Last February I drove to Colorado to do some skiing with my wife's parents, my wife and our two kids. Definitely a car full. My two-year-old son travels in a carseat — but not very well. At one very restless point, I grabbed the Model 100 and quickly wrote a small program to convert every keystroke into a different sound. Bill Jr. had a ball — he specially loved it when he hit the paste key and got a whole series of notes! Not only was he thoroughly entertained, he also performed a valuable service. I could now state for certain the Model 100 keyboard would stand up to the pounding test!

LOVE 100. If you watched Wimbledon you may have caught Martina Navratalova's coach sitting on the sidelines with a small something sitting in her lap. As Martina explained to the camera, the coach used the computer to enter serves and how Martina returns them for later analysis. You guessed it, that small something was a Model 100.

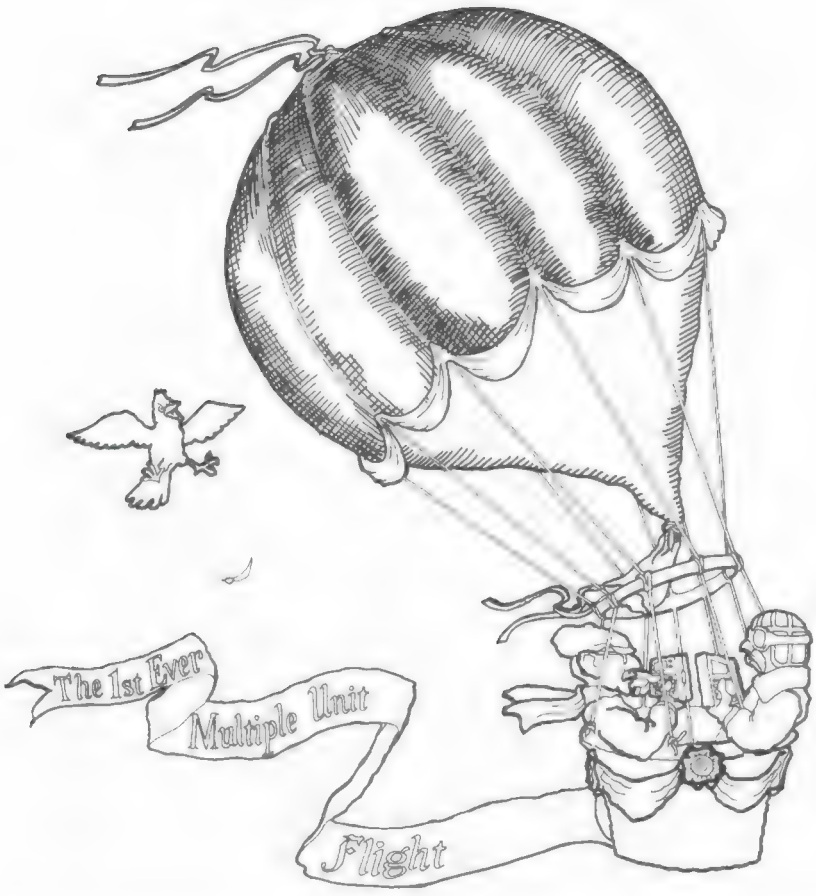
Some less glamorous professions are also packing 100s. Correspondents are jumping on the Model 100 like a duck on a June bug. Engineers want to use them for instrumentation; libraries are actually checking Model 100s out like books in some places. Even the CEO of one of our competitors is reported to be carrying a Model 100. Now there's a man who knows real value!

BAR CODES COMING! By the time you read this, we should have available the bar code reader with accompanying software drivers. It will allow the reading of three types of bar codes: codes 3 of 9, UPC and NATI.

Code 3 of 9 is being required by the Department of Defense for all suppliers. We feel it is a good candidate for an overall federal standard.

You see UPC (Uniform Product Code) everytime you go to the store. I don't mean to imply our bar code reader will read all UPC labels; it won't. Only a laser type reader will successfully read all labels. A standard bar code wand, such as ours, requires a minimum level of "contrast" to differentiate the bar widths.

For example, the UPC label on a disposable bottle of Dr. Pepper is dark blue lines on a lighter blue background. A standard wand like the Model 100's won't read it. The



bar code label needs to have a contrast level of 76 percent or greater for accurate reading. To me, that really means black bars on a white background.

North American Technical Institute (NATI) code is an outgrowth of the paperbyte code covered several years ago by Carl Helmer in *Byte* magazine. It will allow encoding of all 256 ASCII values into bar codes. We feel this will allow printed distribution of Basic programs.

In fact, I already have been told by one source there is at least one book being developed about the Model 100 with program listings in machine-readable bar code as well as human-readable line listings.

The software driver with the bar-code wand will let you access it like one of the devices already provided in the Model 100. It loads from cassette tape, locates itself into the highest area of RAM not used by the system, and resets HIMEM to protect the driver from the rest of the system. Remember, you can find the highest address of user RAM not required by the basic system with the command PRINT MAXRAM. It should give you the value 62960.

The command PRINT HIMEM will give you the highest address of user RAM available to all applications programs. Without a machine-language program (specifically the bar-code drivers) loaded, these two values will be the same. The difference between the values (MAXRAM − HIMEM) is the size of the protected code.

Here's a a quick example:

```
10 OPEN "WAND:" FOR INPUT AS 1
20 INPUT #1,A$
30 PRINT A$
40 CLOSE 1
50 @STOP
```

This opens the wand (bar-code reader) for input as file number one, inputs a line of bar code, and passes the result in string-variable A$, then prints the line read in by "printing" that variable. An obviously trivial example but enough to give you an idea of how it works.

Bill Walters is a buyer for the Tandy Corporation and had overall responsibility for bringing the Model 100 to market.

TRS-80 MODEL 100

All work & no play makes Jack a dull boy . . .

FUN!

2 games packages for your relaxation and enjoyment:

MODEL 100 Games #1

Blockade - Your 'snake' grows longer as you hit the randomly appearing targets on the screen! A one or two player real-time game

Reversi - Outflank your opponent! Play against the computer or another human.

Frankenstein Adventure - Find all of the necessary equipment to awaken the monster

Alexis Adventure - Sail the seas and traverse the islands to recapture your kingdom

MODEL 100 Games #2

Maximum - Outscore your opponent or the computer by taking the higher point squares and leaving a low point choice for them

Checkers - The classic game! Play against the computer or against a human or have the computer play itself!

Amazing Chase - Outrun two pursuers in a maze in this real-time game with optional sound.

Williamsburg Adventure - Steal, eat, shoot, and laugh to find the golden horseshoe!

Choose either of the games packages for only $24.95!

SILVERWARE

- a lot of software for a little silver

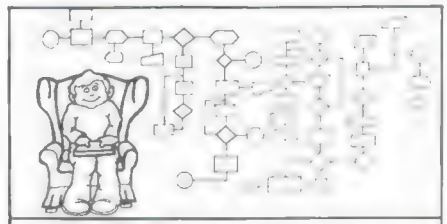
See your dealer or:
Write or call us direct at P.O. Box 21101, Santa Barbara CA 93121 (805) 966-1449

P-100
+
VIC-20

MAKING SOME OTHER MICROS SPEAK MEWS

When it comes to writing programs, the 100 has some limitations. If you have a second computer, there's a way around them.

By DAVID BUSCH



PROGRAMMING

When I am writing long or complex programs for my TRS-80 Model 100, I like to take advantage of powerful programming tools, such as instant renumbering, global search and replace of variables, and cross referencing commands. No, these are not hidden ROM routines, or even utility programs that eat into the already-limited memory of the Model 100. I've found the most useful accessory for the 100 is another computer.

I've written programs with my Model 100 on airplanes, curled up on the couch in front of the television, and, even, seated at a "real" desk in a "real" office. However, despite its portability and powerful Basic, the TRS-80 Model 100 has some limitations when it comes to writing programs. Renumbering must be taken care of by an outside program — so, if I discover that I need to fit 10 program lines between line 550 and 560, an extra step is required. Only eight lines can be displayed on the screen, and they might very well be only one or two extra long program lines.

NATURAL STEP. I've found it easy to write programs on another computer with powerful Basic editing and debugging tools and then transfer them over to the Model 100 for final checkout. Since a significant number of Model 100 owners have second computers, the configuration is a natural. Here are some tips to show you how to write programs that will run properly on both computers, as an aid to debugging.

First of all, is your computer suitable for writing Model 100 programs? Some, such as the Atari 400 and 800 with Atari Basic, have significant differences, especially in string handling, that make easy transfer of programs from one to the other difficult.

COMMODORE 64 The Commodore VIC-20 and Commodore 64 computers are good choices. Their Basic 2.0 dialects are very similar to the Model 100's Basic. A major difference you would encounter frequently is the use of the GET command instead of INKEY$. In writing programs for the Model 100 on a VIC-20, I use the VIC-20 Programmer's Aid Cartridge to do a global change from GET A$ to A$=INKEY$ just before transferring a program. Commodore's clear screen command can be changed to CLS the same way. ELSE and PRINT @ are not used in Basic 2.0, but RND and FRE perform similarly.

The Programmer's Aid Cartridge also has other commands, such as RENUMBER, DUMP (tells values of variables), FIND, and TRACE.

The Commodore 64 might even be a better choice, as it has a 40-column screen, the same as the Model 100. One can set all the screen formats and tabs exactly the way one wants, and they will appear similarly on both computers. By defining string variables as graphics codes instead of using them in the actual program, the program line will operate on both computers, even though the graphics character produced will be different. For example, you might write:

```
10 CAR$=CHR$(132).
20 CAR$=CHR$(81)
```

You would delete line 20 after transferring the program to the Model 100. When the program runs on the VIC-20, CAR$ will appear as a "ball." This will at least let you know that everything is running properly. It is not even necessary to have a terminal program to transfer a program from a Commodore computer to the Model 100. You will need the VIC-1011A or similar RS-232C connector for the Commodore computer. Then, connect the two computers through a null modem. Load the program into the Commodore computer and type:

```
OPEN 2,2,3,CHR$(38)+CHR$(160):
CMD2:LIST
```

The screen output will be routed to the RS-232, and the program listing will be sent in ASCII form to the Model 100.

Other computers can be used to write Model 100 programs, as well. I have found the best suited to be the TRS-80 Model I/III/IV. The Basics are so similar that programs can be tested and run on the Model I/III/IV and then transferred with few changes. Plus, we gain all the Basic programming commands of a sophisticated operating system like NEWDOS 80 or LDOS.

RENUMBERING. For example, I like to be able to scroll through my program listings, a page at a time, by hitting the : and @ keys, under Newdos 80. Renumbering can be accomplished in a second by typing RENUM from Basic. This command can also be used to move blocks of

code around in a program. REF gives a listing of where variables, keywords, strings, and other program components are.

While programs written under the Basic interpreter can be run and tested, it is easier to write some program modules with a text processor, such as Scripsit. First, save the Basic program to disk in ASCII form: SAVE TEST/BAS,A. Then, it can be loaded into your text editor like any other program. Global searches and replaces, and other powerful features can be used with aplomb. You Scripsit owners may want to take advantage of some of the tricks I use.

For example, I write several frequently-used lines, such as A$=INKEY$:IF A$= "" GOTO, or PRINTTAB(10) "– HIT ANY KEY TO CONTINUE =". These are marked with blocks, such as Block A, Block B, and so forth. Then, when I want that module to appear in my program, I hit control (the @ key) S, control-Q. I then reply to the prompt with the name of the block I wish to insert. The module is inserted, without block marker, and the original block is available for additional insertion later.

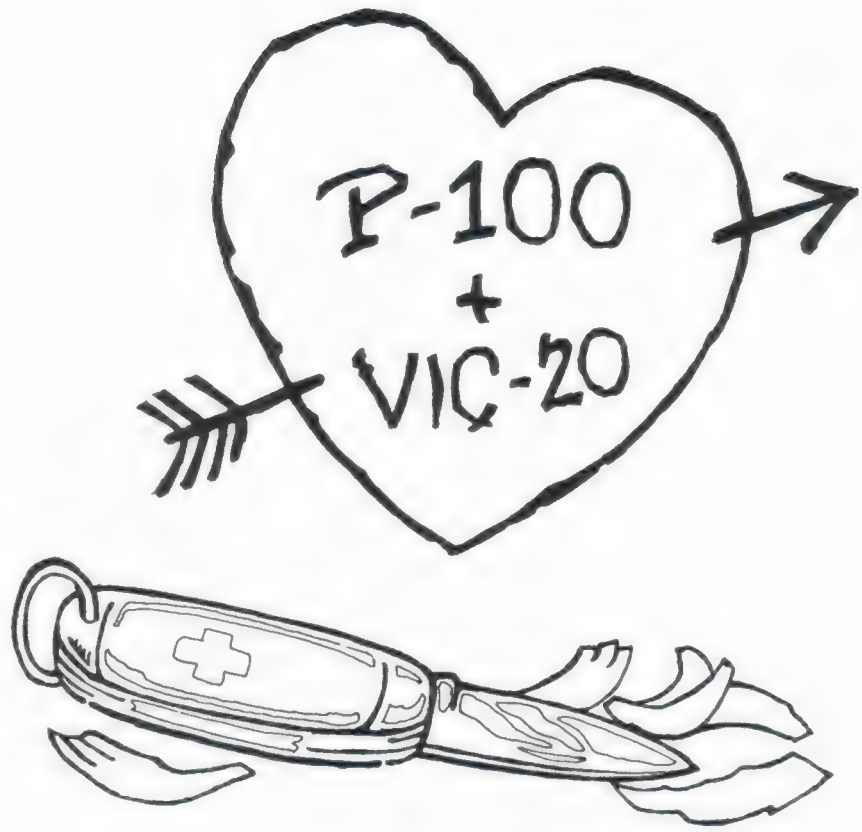
ASCII SAVE. When saving the program, store the test in ASCII form (under Scripsit, type S,A TEST/BAS.) It will then load in Basic just as before. You'll want to store it in ASCII for eventual transmission to the Model 100 anyway.

CMD	LSET
CVD	LOC
CVI	MKD
CVS	MKS
DEF FN	RSET
DEFUSR	USR
FN	TRON
GET	TROFF

Figure 1. Model I,III, IV words unavailable to Model 100 owners.

The trick of duplicating program lines so that they will run under both computers should be done with the Model I/III/IV, as well, although the changes will be minor. I usually have something like the following in my game programs:

```
10 R=INT(RND(1)*N)+1:R=RND(N)
```



The program will produce a random number in the range 1 to N in the Model I/III/IV, and also in the Model 100, when the later part of the line is deleted.

AVOID PEEKS You should avoid POKES and PEEKS, of course, and PRINT @ lines that will point up the differences in the screen display. But, if you simply imagine that your Model I/III/IV has only a 40-column screen, and just eight lines, you can write most programs and transfer them directly to the Model 100. PRINT TAB(n) will work just fine, as long as you avoid tabbing past 40 characters on a given line.

The most commonly used Basic keywords that are available to Model I/III/IV owners, but cannot be used in the Model 100 are listed in Figure 1. You should not include these in any programs you hope to transfer.

FRE(0)
LOAD
RND
MERGE
OPEN

Figure 2. Words with different meanings.

Words with different meanings in the two dialects are listed in Figure 2.

Words not available to the Models I/II or IV in Model III mode are listed in Figure 3.

As you can see from the figures, there is very little, other than screen formating, that differs between the two computer systems.

So, if you want to gain some valuable utilities for your Model 100, more memory for testing out programs before packing them, and, maybe some conveniences like disk storage of programs, check out your computer room. The most useful accessory for your TRS-80 Model 100 may very well be the other computer you already own.

BEEP	SOUND
CALL	PSET
CRSLIN	PRESET
DATE$	POWER
DAY$	MENU
INPUT$	MOTOR
IPL	LINE
KEY	LPOS
KEYLIST	NAME AS
KEY ON	ON KEY
SPACE$	

Figure 3. Words used only by Model 100.

THE COMPUTER CONNECTION

BT ENTERPRISES

THE *Bi-Tech* BAR CODE READER FOR YOUR RADIO SHACK MODEL 100

$279.95 COMPLETE

includes Demonstration and Software

IT'S HERE MODEL 100 MEMORY

Upgrade your Model 100 Memory to as much as 32K

$75.00 each

$70.00 2 or more

Dealers contact Bi-Tech Enterprises at 516-567-2444

BT ENTERPRISES

B·T· Enterprises Dept. 7k
108 Carlough Road
Bohemia, N·Y· 11716

Orders Only
800-645-1165
N·Y· call (516) 567-8155

Dealer Inquires Welcome
Prices subject to change
N·Y·S· Residents add tax

B·T· Enterprises is a division of Bi-Tech Enterprises Inc.
(516) 567-8155 (voice) (516) 588-5836 (modem)

American Express Carte Blanche
Diners Club MasterCard & Visa

Circle No. 10 on Reader Service Card

PORTABLE COMMANDER

JAKE OFFERS SOME NEW COMMANDS TO COUNTER THE PERILS OF PORTABILITY

The world of micro-miniaturization has brought many conveniences to modern society. As Model 100 owners, we currently can consider ourselves at the forefront as far as the size and capability goes. Having said that though, I'm troubled by some new problems in microcomputing.

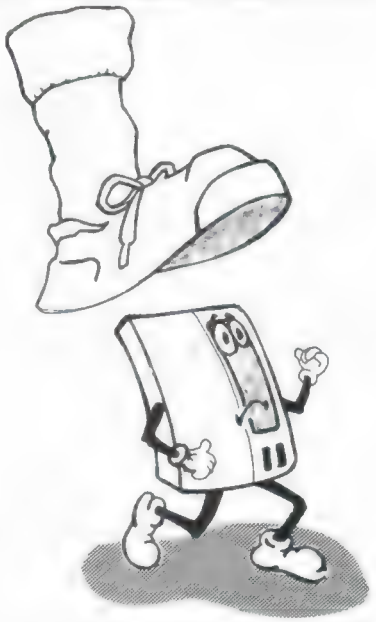
Some technological drawbacks result from the diminishing size of electronic devices. The problems aren't earth-shattering — just the kinds of things humans deal with in everyday.

Heaven forbid I should stoop so low as to aim trivial criticisms at our beloved Model 100, but I'm going to anyway.

SIZE PROBLEM. You see these little problems involve size — or rather, lack of it. True, that much-touted portability brings with it all kinds of conveniences other computer-owners can jealously regard only from a distance.

Yes, it's great being able to actually carry the computer around while it's doing its thing. Why just the other day I had a small task involving stripping characters from lines in a text file. (You know the kind of thing, remove all hyphens or arrow signs or both from the left hand side of each line of text). A piece of cake for the Model 100.

First, it was a matter of finding the file on my Model I, downloading to the Model 100, running the program, and finally using the file. Just for the heck of it, I had the 100 beep every time it stripped a line. I walked happily on to the sun deck, the computer under my arm, beeping like its life depended on it.



You try that on an Apple IIe or IBM PC. You even try working with one on the sun deck. Ah, the glories of pico-computing.

TRIVIAL PROBLEM. So far so good. I worked on my file and uploaded it back to the Model I (all in the cause of maintaining a decent sun tan). Here's where I had one of those trivial problems with size. If Tandy has plans for anything smaller than the Model 100, I'm in trouble. How the owners of the pocket computers manage, I'll never know.

What if they invent a portable no bigger than a gemstone? Okay, you could have it mounted in a ring and do your computing surreptitiously on a plane without asking for permission. Or you could have it mounted on your nose like an East Indian princess. (You could wire the output to allow you to compute by smell.)

All very well until it feeds you some wrong information, gets you into an argument, and you get bopped on the nose. Now, instead of taking you to the nearest hospital, the paramedics whip you away to the nearest Radio Shack computer repair center for a nose job.

LOWER LIMIT. No, I think I'll stick with this size as a kind of lower limit. I didn't mean to avoid the point though. Where was I? Oh yes — back at the Model I.

A couple of days later, I did the same thing again with another file. No problem, the filter program's still in the Model 100's memory. So I find the file, set up the terminal package, and attach the Model 100.

Well that's the lie, and there's one part of that miniaturization problem. I couldn't *find* the Model 100 to receive and beep its way through the file. I was stuck. Where was it? What was I last doing with it? Where could I have last put it down? Good grief, I'd actually lost a computer!

LOST 100. Since that time, I've lost it at least three times. The sight of it has become so familiar around the house, I don't even notice it if it's right in front of me. It's like searching for your glasses when they're on your head. Twice, it's been nestled in the computer room (my computers reside in greater comfort than I do) and I couldn't see the wood for the trees.

Forget the thing powering off if you don't use it for a few minutes. That's old-hat.

I need a new function. Something like a LOCATE command. This would set a timer when the machine switched off. If I hadn't located and started using the computer before this timer was out, it would issue a whooping siren-like sound. I could simply follow the sound to its source and continue my career unabated.

My lonely Model 100 would have found *me*. Isn't that the idea of computing? Let the computer do all the work.

GIN AND TONIC. After the LOCATE command, next on the agenda might be an ON DAMAGE GOTO command. This is required because of another smallness problem. The scenario goes like this:

Having found my trusty machine, I'm still on the sundeck slaving over a hot micro. I'm writing this column and boy, it's hard work. Time for a drink. Something decadent like a gin and tonic might oil the synapses. I put down the Model 100, pour myself the well-deserved cocktail and return to my place of employment. In doing so, I once again forget the exact location of the computer and nearly step on it. No kidding, I've nearly done it a couple of times. I cringe at the idea of my heel going straight into the liquid crystal display. This is where I need an ON DAMAGE GOTO command.

Somehow, the computer would have to sense my clumsy boot heading its way (a simple proximity detector should do the job). In trying to allay the impending disaster, the interrupt-driven subroutine takes over. Panic would be driven into the heart of such a clod as myself as the computer whoops, beeps, and screams blue murder and causes a reflex reaction in my foot. The foot, deserving no better fate, goes skidding off at a crazy angle. The straws from my drink land in my seat. The ice goes over the railing. The gin and tonic drips between the floorboards. The Model 100 beams happily from a safe distance. Thank goodness for that ON DAMAGE GOTO routine.

IBM 370. Next on the problem agenda is a predisposition for dropping the Model 100 while carrying it around. Can you imagine any of these problems in the early days of microcomputing? Let's face it. A Model II is pretty safe from being dropped while being carried around. The solution to this one? Maybe it's the ON DAMAGE GOTO command again. But I'll tell you what. Forget it. I'm going to mount my Model 100 in a glass case and buy something huge.

How much does an IBM 370 sell for these days?

MASS STORAGE ON YOUR MODEL 100

WITH THE

HOLMES PMD-100 PORTABLE MICRO DRIVE

$299.50

FEATURES:

- Wafer Tape Storage
- Optional RAM Buffer
- Battery Operation - Rechargable Battery pack
- Nearly as fast as disks
- Fully Portable-Lightweight
- ROM based OP System

DRIVE COMPLETE READY TO PLUG IN AND RUN

Also for the model 100. . . .

8K RAM MODULES HOLMES IM-100 UP TO 32K RAM

Plugs into existing M100 Memory Sockets with No Modifications

$75.00 ea 8K Module ($70.00 ea 2 or more)

- -CALL & ORDER TODAY- -

Call or write today for a free Product Brochure on The Full Range of TRS-80 Model I, III, & IV peripherals from HOLMES!

CALL FOR NEAREST DEALER
DEALER INQUIRES INVITED

TRS-80 is a registered trademark of Tandy Corp

One year warranty on all products
Add shipping handling—$5.00 U.S. and Canada. All others add 15%. Prices subject to change without notice

HOLMES ENGINEERING, INC.

5175 Green Pine Drive
Salt Lake City, Utah 84107
(801) 261-5652 or 24 Hr BBS (801) 268-1103

Circle No. 11 on Reader Service Card

TAPE TIPS OR KEEPING SANE WITH CASSETTES

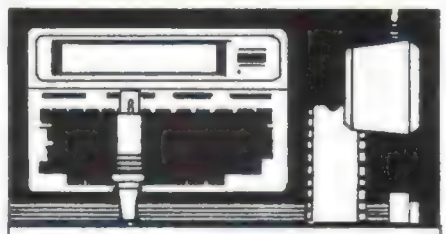
CLOAD has five letters, but to many of us it's a four-letter word.

By DON WATSON

I/O ERROR.

There's a frequent message striking terror in the hearts of many cassette recorder users. With 10K of typed-in code at stake and only two copies of the file on tape, the first copy fails to load. Will the second fail as well? Will you have to retype all that code?

If you use a cassette recorder with your Radio Shack Model 100, chances are you know the problem this article is about. Here are five likely causes of cassette recorder failure to find and load your files and programs accurately — with practical solutions offered to help you avoid those failures.



HARDWARE

ELECTRICAL NOISE. Do the lights dim briefly every time your air conditioner comes on? Does your TV flip when the washer or dryer starts a cycle? Those symptoms are evidence of electrical noise problems causing data writing and reading failures with your cassette recorder. Furnace fans, sump pumps, shop tools, and flickering fluorescents are among the many causes of electrical noise in the AC power source to your computer and cassette recorder. If you suspect you have a noisy AC source, there are some simple steps you can take to avoid the problems.

Here are some solutions to this problem:

- Use the computer and the tape recorder in battery mode; don't use a 6-volt DC adapter with either, and don't use the AC line cord with the recorder. Be sure your batteries are up and ready. You can plug back in to the AC source whenever you're not actually saving or loading a file. You'll find more information on batteries at the end of this article.
- Turn the offending devices off, or prevent it from coming on while you save or load data to the cassette recorder.
- Try a different time, a different location, or both. If your troubles are at home, try the office. For example, AC power system noise tends to be at a minimum in small office buildings on weekends, when the offices are closed and no one is around (lights are off, heating and air conditioners are off, etc.)
- Use an electrical noise filter. Radio Shack sells an 8-outlet filter with a built-in switch; $49.95, Catalog No. 26-1451. ESP Inc. sells a 6-outlet (two banks, three outlets per bank) filter; $76.95, Model No. IS0-2, call 1-800-225-4876 toll free. Aside from filtering AC noise, devices like these can actually prevent damage to your equipment.
- Special Note: Don't switch your printer on or off while saving or loading files with your cassette recorder.

RECORDER TECHNIQUE. You may be innocently using techniques causing cassette-recorder, file-loading failures; that is, failure to find the file name or failure to load the file accurately, even if the file name is found. The computer and cassette recorder manuals tell you what buttons to push and what commands to use, but that's not enough.

Read the following solutions for information the manuals don't provide:

- As you build a file (composing text or developing a program), you are tempted to save it periodically at the same starting location on a cassette, using the tape counter for guidance. If you're not careful, you may start a rewrite late enough on the tape to leave a portion of an earlier recorded file name intact. In that case, the next time you try to load that file the computer will probably fail to find the file name. You may not get an ?IO ERROR message, but the file won't be loaded either.

Whenever you want to save a file to a cassette, rewind the cassette fully, reset the tape counter (to 000), and use the manual record mode to move (and erase) the tape to a starting position — certainly past the tape leader. Then use computer control to save the file. To save a second copy, use the manual record mode again to move (and erase) the tape to a second starting position. Use computer control to save the file a second time. Using this technique, you can be sure that your recorded files are not preceded by residual recorded (fractional) file names.

Remember to make a record of the tape counter starting positions. To load the file, first position the tape to a point just ahead of a starting position — not right at it and not past it.

- Once you've started the recorder loading a file, don't abort the operation. You'll be tempted to abort if you realize you're looking for the file in the wrong place on a cassette (or on the wrong cassette), get a SKIP: (filename) message, or fail to find the file name when you think it should have been found.

Resist the temptation; lifting the read-write head from the tape in the middle of a file may leave that file permanently unreadable. Let the recorder run just past the end of the

file to the blank tape space between recorded files. This takes some patience on a long file, but lifting the head may cause you to need even more of your patience later.

TAPE QUALITY. Ripples, streaks, spots, and other defects on the surface of a tape will be right where you want to record — Murphy's Law assures it.

Here's some things to look for in tape:

- Expensive "computer-grade" cassettes are not necessarily good quality cassettes; all manufacturers have their quality problems. Visually inspect at least a portion of the tape surface in any cassette before you use it. Hold the cassette in one hand and a mechanical pencil (lead retracted) in the other; use the pencil tip to engage a cog in either tape reel center. Run the pencil tip around the cassette to reflect the light from the tape surface to you. You'll find you can detect ripples, creases, and discolorations if there are any. You may also find tape reels that do not rotate freely. If you find defects, mark the cassette as (at least) suspect; if it fails to give you accurate use where other tapes succeed, destroy it.
- Maintain the quality of your known good tapes by protecting them from excessive heat or cold, magnetic fields, and surface contamination. Store the cassettes in the handy flip-top cases. If you keep a cassette in your recorder, be sure the head is retracted when the tape is not in use.
- If your system consistently fails to find file names or consistently delivers ?IO ERROR messages with a cassette while other cassettes consistently perform accurately, consider destroying the offending cassette.

ATTITUDE AND PACE. If you operate your computer system with an attitude of general impatience, tend to poke keys first and consider the consequences later, the cassette recorder may be more than you can (or want to) put up with. Those characteristics will lead you to errors of omission and commission, and to an intolerable level of frustration.

To avoid these kinds of problems:

- Do what you can with the solutions given earlier.
- Keep files and programs short;

the shorter they are, the lower your frustration level will be in the face of failure to load. You'll spend less time waiting to try again (remember that aborting the load operation before the end of the file may make the file unreadable).

- Think first, then punch the right keys.
- Don't try to change your way of life. Make some notes on your problems and what you've done to solve them. Then see your equipment dealer for help.

RECORDER DIFFERENCES. Most often, you'll be saving and loading your files with your own equipment. You may have special problems if you try to load files from a cassette prepared with another recorder. Mechanical differences (tape speed, head alignment) and electrical differences (signal levels, head sensitivity) between recorders can cause loading failures.

When confronted with alien tapes, try these tacks:

- The best you can do is try loading the program into any Radio Shack Model 100 computer. If you get lucky and can get the program into a computer's memory, save it to one of your cassettes using your own recorder. The program will very likely load into your computer from that cassette. Sounds like a hassle, and it is; but if it works, you've saved an even greater hassle.
- Your equipment dealer should be able to help with the solution just mentioned. While you're there, see if the dealer will check your recorder tape speed and signal levels.

MORE ON BATTERIES. Whether you have and use a cassette recorder or not, the following suggestions can save you much grief:

- Get an inexpensive battery checker. Radio Shack sells a good one that tests batteries under load conditions; $9.95, Cat. No. 22-031. It's important to check your spare batteries from time to time to be sure they are really ready when you see a "battery low" indication on your computer or on your recorder.
- Never assume batteries you get from the shelf at the store are "fresh". Check them (or have them checked) before you leave the store. Most battery packages have holes provided for tester probes.

HOPE FOR THE FUTURE. Cassette recorders used for off-line microcomputer memory have been a pain since first used for that purpose. I used a Panasonic RQ-2309 tape recorder with my first microcomputer in 1978. I'm now using a Radio Shack CCR-81 computer cassette recorder with my TRS-80 Model 100. Things have not improved much in those five years.

I find life easier now (as I did then) when I use the suggestions and techniques outlined in this article. The system works well enough that I am willing to develop significant programs (10K bytes and longer) with nothing but the cassettes to store them on. There is no assurance the solutions given here will solve all of your cassette recorder problems, but they probably will and are worth trying.

The final solution to the cassette recorder problem will be disk drives, hopefully the 3-by-3-inch kind. When that happens, it'll hurt my pocketbook, but I'll be more than happy to stash the CCR-81 in my equipment morgue with the RQ-2309 so they can gather dust together while I get some work done!

TRANSFORM YOUR PORTABLE INTO A MUSIC MACHINE

Your Model 100 should not be taken for a musical instrument. Or should it?

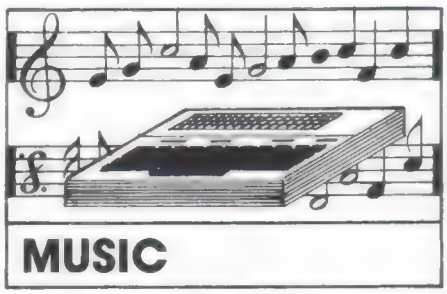
By JOEL and DEBRA DINDA

Perhaps you've attempted to write a program which plays a simple tune by using the Model 100's sound instruction. And perhaps you've abandoned the effort as a needlessly cumbersome process. Or maybe you've succeeded, and thereby burdened your computer's memory with long lists of data statements painstakingly drawn from the chart in the manual. Music Machine is a better solution.

Why is it a better solution?

- Because any practiced musician can easily learn to put a song into Music Machine notation.
- Because it doesn't require that you keep translating standard music notation into essentially arbitrary numbers.
- Because it makes effective use of the 100's memory. (It even fits comfortably into an 8K machine.)
- Because Music box is easy to use.

While no one should mistake the Model 100 for a musical instrument, your computer can be taught to play melodies. The sound instruction is much more than a beeper. Some of its capabilities must be called absurd — but its potential is intriguing.



It manages, for instance, to crowd over 8,000 separate pitches into a single octave. (These are too closely spaced for the human ear to distinguish!) It also produces about 200 pitches which cannot be heard and are not obviously useful. Why these capabilities were included will doubtless remain a mystery. What can be done with them is the subject of this article.

HOW IT WORKS. Music Machine works like this:

The program first lists all the files you've stored in your Model 100 and tells you they are your choices. Typically, of course, this list will include one or more files which are not songs; since you've better judgement than the computer, you'll likely have the good sense not to enter one of those filenames when the program asks for a song title.

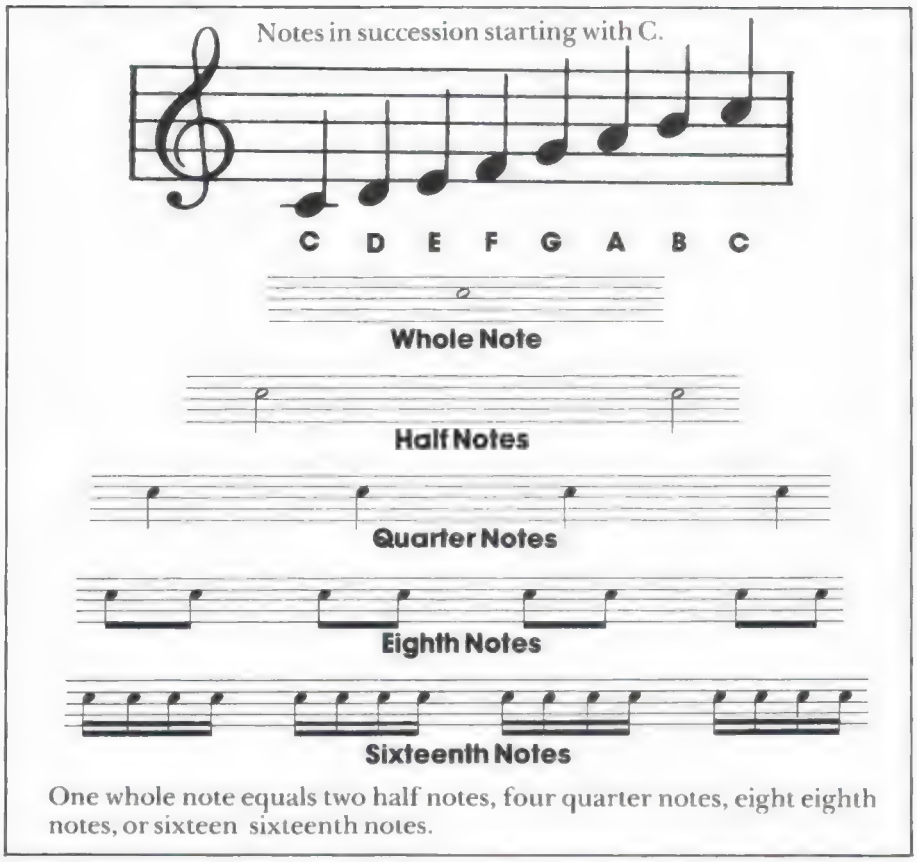
Next, the program asks how many songs you wish to hear. Five is the limit; entering a higher number will result in a non-fatal error message while the computer corrects your entry to five.

Then, for each song, it asks for a "title," and how many times through you would like to hear it. We use quotes here because few songs have titles which can be fitted into a six-character file name. (The .DO extension, by the way, is optional.)

Music Machine then follows your instructions and plays the songs. When it completes those, it asks whether you'd like to continue. Should you say yes, it repeats the routine.

HEART OF BOX. At the heart of Music Machine is its musical notation system. The manual's chart of note equivalences is far too difficult to use. Instead, we've put the chart into the program and taught it how to find the correct instructions for the sound generator. The program reads a formatted file consisting mainly of representations of musical notes, which it translates into those instructions.

The Model 100 cannot read standard music notation, so a similar system must be devised. We have used three characters for each note. Single character representations



One whole note equals two half notes, four quarter notes, eight eighth notes, or sixteen sixteenth notes.

could be possible, but we would in practice be limited to the two hundred or so unique characters the Model 100 keyboard produces. The resulting "notation system" would be virtually impossible to read or use. Two-character notations prove similarly unsatisfactory.

How can you format a song for Music Machine to play? First, select a file name you will recognize as your song's title. The usual six character limits apply here. Compromises have to be made; sometimes the title bears only a slight resemblance to the song's actual title.

Music Machine expects the first line of the song file to include three pieces of information. These indicate the tempo, key, and song title. An integer indicates tempo; four is extremely fast, while 16 is the slowest allowed. (See table 1 for more detailed information.) Follow the tempo with a comma.

KEY SIGNATURE. The key signature is indicated by counting the sharps (#) or flats (b) at the beginning of the song. Flatted keys are indicated with fn, where n is the number of flats in the key. Sharped keys are similarly indicated with sn.

Numbers from 0 to 5 are accepted for n in the key signature. The program expects accidentals to be flats if the key signature contains flats, and sharps if it contains sharps. f0 and s0 are the same key, except one expects accidentals to be flats, the other sharps. Follow the key signature with a comma.

The song title may use any format but should not exceed 36 characters. It *must* be followed by a carriage return.

The remainder of the file contains the notes for the song, organized into phrases. Each note uses a "dpn" format: where d is duration, p is pitch, and n is octave. For example, middle C can be represented by QC1.

DURATION. The program recognizes the arguments in figure 1 for duration.

Tied notes are not provided for, but can generally be represented directly if you don't care about such formalities as bar lines (which don't show in this system, anyway).

Triplets are also permitted. One third of a triplet-within-a-quarter is created with a "3", while ## does the same for a half note.

Music Machine plays in the key it's told to play in by the song file. Pitch is the customary A through G with accidentals being indicated by lower case, with the details depending on the key. Sharped keys expect accidentals to be sharps, flatted keys expect flats. You'll have to convert flats within sharped keys to sharp, and vice versa. Those accidentals which don't match the key signature will have to be converted. Four octaves are used; they are labelled 0, 1, 2 and 3.

OCTAVE BREAKS. The octave breaks in the program are between B and C; that is to say B0 is the next note below C1 and so on. Table 2 shows the accepted pitches. Notice that while C0, c0 and D0 are permitted by the program they will not create notes which can be heard. You may also discover our chart varies slightly from the chart in the

Tempo Value	Beats/Minute	Tempo	
4	180	Presto	very fast
5	150	Vivace	
6	120	Allegro	fast
7			
8	100	Andante	moderate
9			
10			
11		Adagio	
12		Largetto	
13	60	Largo	slow
14			
15			
16	50		very slow

Table 1. Approximate Tempo Equivalents. These values are approximations. Try an appropriate value. If it doesn't sound right, change it.

manual. These differences are also explained in table 2.

QR0 is a quarter note rest; longer or shorter rests can be generated in the same fashion as longer or shorter notes. As this instruction actually generates a very high note, overuse of rests can sound very strange. Experiment.

A song's notes can be organized into logical phrases by the use of carriage returns. You will have to decide where you want your phrases to end. A problem, easily fixed, is sometimes caused by unusually long phrases, which result in OS Error messages. The easiest remedy is to divide the phrase into two shorter phrases.

Within the phrases the notes are not separated. If you insert commas or spaces Music Machine will malfunction.

If you do not wish to translate your own songs, we've included a few tunes here. You may wish to compare the two versions of *Joy to the World*.

HINTS AND COMMENTS. Generally speaking, we designed Music Machine with two objectives: We wanted to remain near conventional musical practice and use as little memory as necessary. Where these conflicted, we generally sacrificed convention to conserve memory.

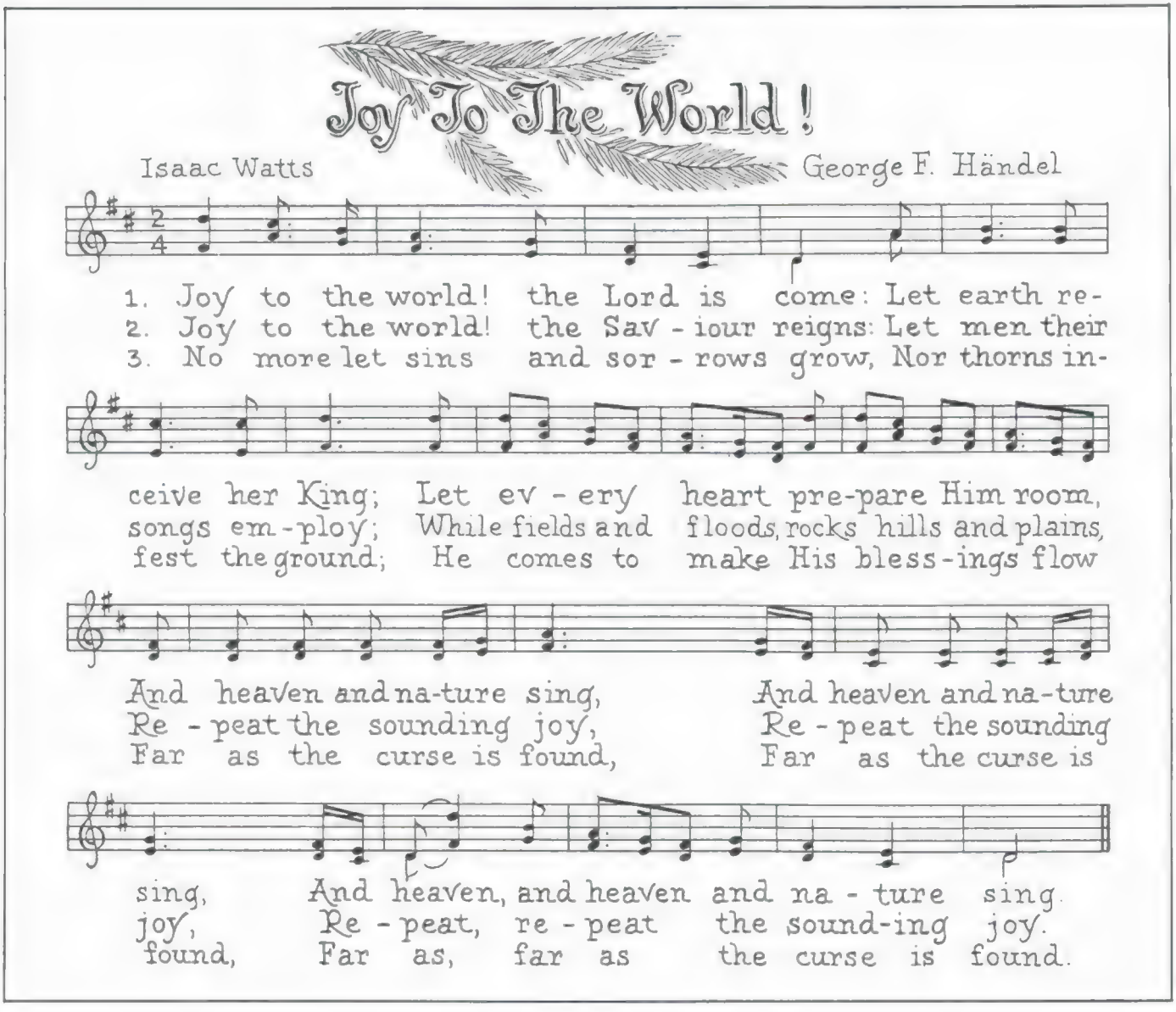
```
S is a sixteenth note
E an eighth note
e a dotted eighth
Q a quarter note
q a dotted quarter
H a half note
h a dotted half
W a whole note
```

Figure 1. Duration Arguments.

We made three assumptions:

- Normal programming practices make sense. In particular, variables are easier to manipulate than constants, and loops are preferable to long strings of instructions.
- Since few songs exceed two octaves, Music Machine provides only a four octave range.
- Similarly, only seven or so note durations are normally used in songs. Only the most common durations were therefore provided.

Octave zero starts in the middle of a baritone's range, and octave three will out-reach most sopranos. Our experience is that songs sound best if



they are written mostly in octave one.

Music Machine is extensively remarked. Stripping the remarks from the program will save you about 600 bytes.

The program's memory overhead is about 1400 bytes.

The manual and the Quick Reference Guide provide useful charts which supply appropriate arguments for pitch. We offer here a slightly different, more useable version (table 2).

MANUAL WRONG. The following notes are wrong in one or both of Tandy's charts: D# (2)=3950, F(2)=3728, and B(3)=2488; you will probably want to correct your charts, if not use ours. Additional pitches are also available, as well; most useful are D#(0)=15800, E(0)=14912, F(0)=14064, and F#(0)=13284. Although octaves 4 through 10 are available, we can't imagine any use for them.

Our version of the chart has three significant advantages over Radio Shack's. First, we indicate both flats and sharps. Second, our arrangement is more obviously sensible, from a musician's perspective. Finally, our pitches are more accurate.

Beware: Our pitches, like Tandy's, are at best only relatively correct. While we haven't done an elaborate study, both Model 100s we've been able to check out were a bit flat from conventional tunings.

As the manual indicates, all values below 16384 return pitches from the sound generator; if all you want is a tone, use any number above about 600 for the pitch argument.

Pitch arguments below about 200 return inaudible tones.

Multiplying a series of pitches by *any* constant will give you the same melody in a different key.

SPECIFIC PROBLEMS. Since Model 100 Basic lacks a pause command, other means were devised to represent a rest. Generating a very high pitch of the appropriate duration serves the purpose.

Inasmuch as the computer does not make instantaneous calculations, the delays between notes have noticeable effects on the rhythms produced by the sound generator. Our solution to this problem was to slightly shorten the length (we call it duration) argument for each note.

While we were able to teach Music Machine to imitate key signatures, the system we've used cannot be considered ideal. Specifically, accidentals are inadequately provided for. Unfortunately, adequate provisions would have required much more memory than we think the problem justifies; they would, moreover, have significantly slowed program execution. Odd accidentals, therefore, must be converted to another note in order to translate some songs to Music Machine notation. (But this should be a very rare problem.)

Some phrasing can be done by taking advantage of the computer's necessary calculation time. Reading the next phrase, for instance, makes a noticeable delay. This is the only phrasing device Music Machine provides. Indirect measures — for instance, writing ritards into the song file — are possible and may be worthwhile.

All users should be aware that longer phrases take longer for Music Machine to process than short phrases. This can be quite noticeable on rapid pieces of music.

If you keep a lot of files in your Model 100, you may have some problems with the Music Machine display.

Although the octaves *always* break between B and C, as marked on a musical staff, b-sharp or c-flat (if, improbably, needed) may be on either side of the line. Adjusting the octave should solve the problem.

GLOSSARY OF MUSICAL TERMS

Key Signature: Sharps or flats, grouped at the beginning of each staff, that affect every note of the same name throughout the piece.
Tempo: The pace of a piece. Usually written above the staff at the beginning of a piece.
Sharp: Raises the pitch of the note that follows it by a half step.
Flat: Lowers the pitch of the note that follows it by a half step.
Natural: Restores the pitch of a note previously affected by a sharp or flat.
Accidentals: Sharps, flats, or naturals. Affect all notes on the same line or space for one measure.
Duration: Length of time over which a note sounds. Measured by beats or counts.
Pitch: Tone of a note, determined by the number of vibrations comprising the note.
Octave: a.)An interval of eight full tones. b.)The series of eight tones making up that interval. c.)The eighth tone from any given tone.
Tied notes: Two notes of the same name played smoothly. The first note is actually played for the duration of both.
Bar Lines: The lines separating one measure of written music from another. They serve an arithmetic purpose.
Triplet: A group of three notes to be played in the time of two of equal value in the regular rhythm.
Quarter note: One quarter the duration of a whole note.
Half note: One half the duration of a whole note.
Whole note: The standard note duration on which all others are based.
Rest: Symbol indicating silence. Each note has a corresponding rest with the same time value.
Phrase: A group of notes in a piece, similar to a grammatical phrase.
Ritard: Gradually diminish speed.

—*Lynn Rognsvoog*

Pitch (Sharp/Flat)	Octave 0	1	2	3
B	9952	4976	2488	1244
a/b	10544	5272	2636	1318
A	11171	5585	2792	1396
g/a	11835	5917	2958	1479
G	12539	6269	3134	1567
f/g	13285	6642	3321	1660
F	14075	7037	3518	1759
E	14912	7456	3728	1864
d/e	15798	7899	3949	1974
D	xxx	8369	4184	2092
c/d	xxx	8866	4433	2216
C	xxx	9394	4697	2348

Table 2. Sound Generation Chart. This is the pitch chart used by The Music Machine. This arrangement seems clearly preferable to the one in the user manual. The additional notes were obvious enough that their omission is rather mysterious. Our D#(2), is clearly correct and Tandy's is clearly wrong. Except those, the differences are too small to hear. Several more octaves are available (keep dividing by two, crosswise), but are too high to be tolerated.

```
0  THE MUSIC BOX
10  ' plays songs
11  ' Joel Debbie Dinda
12  ' version as of 22 July 83
13  ' (Thanks to Ronald W. Johnson
14  ' and Jim Stutsman for help.)
100  DEFINTA-Z
     :CLS
     :CLEAR330
     :MAXFILES=1
101  DL$="S3E#eQaHhW"'duration label
102  DIMNA(12,3),SQ$(5),RP(5),D(10),S$(5),F$(5)
     'notes,arrayed;song(s);repeats;durations
     ;sharps;flats
103  C=18788
     :FORJ=0TO3
     :FORI=1TO12
     :NA(I,J)=CINT(C+.5)
     :C=.9438743127*C
     :NEXTI,J
     :NA(1,0)=0
     :NA(2,0)=0
     :NA(3,0)=0'four-octave note array
104  S$(0)="CcDdEFfGgAaB"
     :S$(1)="CcDdEeFGgAaB"
     :S$(2)="bCDdEeFGgAaB"
     :S$(3)="bCDdEeFfGAaB"
     :S$(4)="bCcDEeFfGgAB"
     :S$(5)="bCcDEeFfGgAB"'sharped keys array
105  F$(0)="CdDeEFgGaAbB"
     :F$(1)="CdDeEFgGaABc"
     :F$(2)="CdDEfFgGaABc"
     :F$(3)="CdDEfFgGAbBc"
     :F$(4)="CDeEfFgGAbBc"
     :F$(5)="CDeEfFGaAbBc"'flatted keys array
120  GOSUB3500'song selection
```


Computer Books For Beginners

New At Your Bookstore

Portable Computers

44 Programs for the TRS-80 Model 100 Portable Computer. by Jim Cole, practical programs to make lap-sized portable do real work immediately, ideal for business, home, 96 pages.
ISBN 0-86668-034-9. **$8.95**

ARCsoft Publishers

TRS-80 ALWAYS AT SALE PRICES

COMPUTER CENTER **WE SHIP** *FAST!*

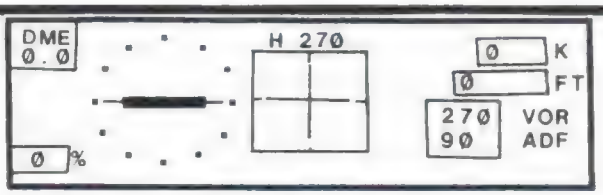
DFW COMPUTER CENTER
326 MAIN ST., GRAPEVINE
TEXAS 76051 — (817) 481-7283

OUR TRS-80s Have the Radio Shack warranty

To get YOUR SALE price CALL:
1-800-433-S A L E

Circle No. 13 on Reader Service Card

Circle No. 14 on Reader Service Card



PILOTS !

MODEL 100 INSTRUMENT TRAINER PROVIDES REALISTIC SIMULATION OF THESE APPROACHES:

ILS	ADF
VOR / DME	LOCALIZER
TACAN	BACK COURSE

ANALYZE YOUR PERFORMANCE WITH POSTFLIGHT PLAYBACK OF GROUND TRACK AND GLIDEPATH.

REQUIRES 24K MODEL 100 AND CASSETTE PLAYER.

INCLUDES INSTRUCTIONS, PRACTICE APPROACHES AND CASSETTE.
$29.50 + $2.00 POSTAGE

POCKET PROGRAMS
BOX 1568
SPRING, TX 77383

M-100 SMALL TALK

- Interface your Model 100 with the IBM PC or Commodore 64
- Send or retrieve files
- Utilize your IBM PC or Commodore 64's screen, printer or disk.
- $59.95 — null modem included

Send check or money order to:

KEY SOLUTIONS, INC.
19 SILVERMINE ROAD
NEW CANAAN, CT 06840

(Connecticut residents please add 7.5% sales tax)

IBM PC is a trademark of IBM Corporation.
Commodore 64 is a trademark of Commodore Business Machines, Inc.

Circle No. 15 on Reader Service Card

```
130 CLS:LINE(0,0)-(239,63),1,BF
    :FORI=1TOSO
    :OPENSO$(I)FOR INPUT AS1
140 INPU#1,SN,KY$
    :D(1)=SN
    :D(2)=SN*4/3
    :D(3)=SN*2
    :D(4)=SN*8/3
    :D(5)=SN*3
    :D(6)=SN*4
    :D(7)=SN*6
    :D(8)=SN*8
    :D(9)=SN*12
    :D(10)=SN*16'sets tempo:sn=sixteenth;ky=key
141 IF LEFT$(KY$,1)="s"THEN'$,1)=
    KY$=SS(VAL(RIGHT$(KY$,1)))
    ELSE KY$=FS(VAL(RIGHT$(KY$,1)))
    'checking and assigning key signatures
150 GOSUB2000'display
160 FORJ=1TO RP(I)
    :IFJ>1THEN OPEN SO$(I)FOR INPUTAS1
    :LINEINPUT#1,PH$
170 GOSUB2500
    :CLOSE
    :NEXTJ
    :LINE((118-6*(INT(LEN(TI$)/2+.5)+2))
    ,21)-((120+6*(INT(LEN(TI$)/2)+2)),33),1,BF
    :NEXTI'perform
180 PRINT@240,"Want to hear any more";
    :INPUT CH$
190 CLS
    :IF LEFT$(CH$,1)="y"THEN GOTO120ELSE END
2000 'routine to print song title
2010 LINEINPUT#1,TI$
2020 LINE((118-6*(INT(LEN(TI$)/2+.5)+2)),21)-
     ((120+6*(INT(LEN(TI$)/2)+2)),33),2,B
     :OT$=TI$
2030 PRINT
     CHR$(27);"p"
     :PRINT@118+(40-LEN(TI$))/2,"* "+TI$+" *"
     :PRINT CHR$(27);"q"
2040 RETURN
2500 'plays songs
2510 LINEINPUT#1,PH$'PH$=phrase
2520 FOR PN=1 TO LEN(PH$)STEP3'position
2530 NT$=MID$(PH$,PN,3)
     :DU$=LEFT$(NT$,1)
     :PT$=RIGHT$(NT$,2)'note,duration,pitch
2540 PT=NA(INSTR(KY$,LEFT$(PT$,1)),VAL(RIGHT$(PT$,
     1)))
     :DU=D(INSTR(DL$,DU$))
2550 SOUND PT,DU-2
2560 NEXT
2570 IFEOF(1) THEN RETURN ELSE GOTO2510
3500 'finds out name of song
3510 PRINT"Your choices are:"
     :FILES
3520 PRINT@200, "How many songs do you want to
     hear";
     :INPUT SO
```

```
:IFSO>5THEN PRINT@200,SPACE$(39)
:PRINT@200,"SORRY.Five's all I can keep track of."
:SO=5
:SOUND0,150
3530 FORI=1TOSO
:PRINT@160,SPACE$(119)
:PRINT@160,"Song #";I
3540 INPUT "What song would you like to hear";SO$(I)
3550 PRINT@242,"How many times through";
:INPUT RP(I)
:NEXT
:RETURN
:ap px0049/sng
```

SONGS FOR YOUR MUSIC MACHINE

8,s2,Joy to the World

QD2eC2SB1qA1EG1QF1QE1qD1EA1qB1EB1qC2EC2hD2
ED2ED2EC2EB1EA1eA1SG1EF1ED2ED2EC2EB1EA1eA1
SG1EF1EF1EF1EF1EF1SF
1SG1qA1SG1SF1EE1EE1EE1SE1SF1qG1SF1SE1ED1QD2EB1
eA1SG1EF1EG1QF1Q
E1HD1

10,s0,Hard Times by Stephen Foster

Ed1EF1QG1EG1EG1EG1Qa1EG1EF1Ed1Ed1EF1QG1
eC2Sa1Qa1QG1EG1Ed1eF1SF1Hd1QR0
Ed1EF1QG1EG1EG1EG1Qa1EG1EF1Ed1Ed1EF1QG1
QC2Qa1QG1EG1Ed1eF1SF1Hd1QR0
EG1Eg1qa1Ea1Qa1EA1Ea1qC2Ea1qa1ER0
Qd2Qa1EC2Ea1Qa1EG1EG1EF1Ed1QF1
Ed1EF1QG1EG1EG1EG1Qa1EG1EF1Ed1Ed1EF1QG1
QC2Qa1QG1EG1Ed1eF1SF1hd1

8,s1,Allemande (Johann Schein)

EG1EA1QB1QA1ED2EC2QB1EA1EG1HA1EA1EB1QC2QB1
EE2ED2QC2EB1EA1QB1QA
1EB1Ec2QD2QD2Qc2HD2HD2
EG1EA1QB1QA1ED2EC2QB1EA1EG1HA1EA1EB1QC2QB1
EE2ED2QC2EB1EA1QB1QA
1EB1Ec2QD2QD2Qc2HD2HD2
QD2QC2HB1QC2QB1HA1EB1EA1QG1EA1EG1QF1EG1
EF1QE1QD1QD1EE1EF1QG1QG
1QF1HG1HG1
QD2QC2HB1QC2QB1HA1EB1EA1QG1EA1EG1QF1EG1
EF1QE1QD1QD1EE1EF1QG1QG
1QF1HG1HG1

6,s0,Yankee Doodle

EC2EC2ED2EE2EC2EE2ED2EG1EC2EC2ED2EE2QC2EB1
SG1EC2EC2ED2EE2EF2EE2ED2EC2EB1EG1EA1EB1QC2
QC2
eA1SB1EA1EG1EA1EB1QC2eG1SA1EG1EF1QE1QG1eA1
SB1EA1EG1EA1EB1EC2EA
1EG1EC2EB1ED2QC2QC2

Circle No. 16 on Reader Service Card

8K MEMORY MODULES
FOR THE MODEL 100
PORTABLE COMPUTER

$85 each
2 or more $80 each

Exact Replacement for RS Memory
Easy to Install
Warranty Included
VISA and MC Accepted

iota systems
1690 Day Valley Road
Aptos, CA 95003
(408) 684-0482

Prices Subject To Change Without Notice
TRS-80 is a trademark of Tandy Corporation.

TRS-80 MODEL 100*
FINANCIAL ANALYSIS
PACKAGES 1

Menu driven program to determine the following:
- equal loan payment amount
- original loan balance
- loan interest rate
- number of payments required to pay-off loan
- compound interest ending balance
- compound interest beginning balance
- equivalent compound interest rates
- ending balance for annuity
- deposit amount required for annuity
- bond yield
- bond purchase amount for desired yield

Program Features:
Extensive user manual
Menu screen driven
Over 20 user friendly screens
Uses function keys for menu selection
Complete date logic
Year-to-date interest for amortized loans
All input fields verified

PACKAGE CONTAINS BOTH 16K and 8K PROGRAMS

16K version includes:
User manual, One casette Tape
One program containing all functions

8K version includes:
User manual, one casette tape
Four programs containing all functions

To order, send Check, Money Order or Certified Check to:
York Software
2685 Tanglefoot Lane #8
Bettendorf, Iowa 52722
or call (319) 322-5715

VISA MasterCard

TOTAL PACKAGE $39.00

TRS-80 is a trademark of Tandy Corporation
YORK SOFTWARE

Circle No. 17 on Reader Service Card

Make Every Minute Count

Answer Letters, Write Memos and Prepare Reports Anywhere, Anytime with Radio Shack's TRS-80® Model 100

8K Model 100

799.00 26-3801

As Low As $45 Per Month
On CitiLine Credit

24K Model 100

999.00 26-3802

As Low As $56 Per Month
On CitiLine Credit

The Micro Executive Workstation™

Make the most of your time with the TRS-80 Model 100 Portable Computer. With its built-in personal word processing program, you can compose and edit documents virtually anywhere.

Stuck in a taxi at rush hour? Use the time to write a memo, revise a speech or get a head start on your monthly report. Take the TRS-80 Model 100 with you on business trips—it fits easily in your briefcase with room to spare!

A "User-Friendly" Computer

Turn Model 100 on and you get a menu of five built-in management programs—plus your own files—listed on its eight-line by 40-character liquid crystal display. You can select the personal word processing program with powerful editing features. It features automatic "word-wrap"; the ability to define blocks of text by character, word, line, above or below cursor position; and easy manipulation of defined text blocks with the move, copy and delete function keys.

Model 100 also works as an appointment calendar, address book, phone directory and telephone auto-dialer. You can even write your own BASIC programs! In addition, Model 100 features a full-size typewriter keyboard, is powered by batteries or optional AC adapter, and retains all data with power off.

Complete Telecommunications

The Model 100 minimizes the inconvenience of business travel. With an optional cable, plug Model 100 into any modular phone jack and use its built-in auto-dial modem to access national information services. Or send back any text files to your office computer so typed copies can be ready to sign upon your return! You could, if you wish, wait until you return and connect Model 100 to an optional printer via its parallel interface.

Model 100 also features a cassette port for our ready-to-run programs, plus an RS-232C interface to connect the Model 100 directly to another computer—micro, mini or mainframe.

Find Out More

Visit your nearest Radio Shack Computer Center, participating store or dealer for a demonstration of the revolutionary TRS-80 Model 100.

Radio Shack®

The biggest name in little computers®

A DIVISION OF TANDY CORPORATION

Prices apply at participating Radio Shack stores and dealers
Microsoft is a registered trademark of Microsoft, Inc

Circle No. 18 on Reader Service Card

NEW 1984 TRS-80 CATALOG. Send for your free copy.

Mail To: Radio Shack, Dept. 84-A-793
300 One Tandy Center, Fort Worth, Texas 76102

NAME _____

COMPANY _____

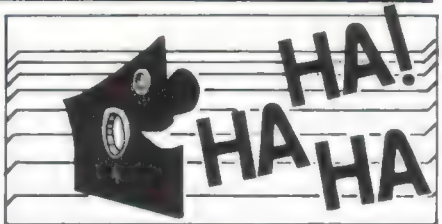
ADDRESS _____

CITY _____ STATE _____ ZIP _____

TELEPHONE _____

MELTDOWN AT THE SUPERMARKET

Columnist Eliscu's suspicions about computers are confirmed at the checkout counter.



HUMOR

By MARGERY ELISCU

Editor's Note: While most of us realize the limitations of our beloved micros, Ms. Eliscu has this gentle reminder for those of us forgetting many people still feel the common ground between computers and humanity to be voodoo. Our thanks to The Maine Sunday Telegram *and Ms. Eliscu for giving us permission to reprint this article.*

I'm pretty upset about computers. Every place I go, people tell me they are the wave of the future. Frankly, that makes me feel a little lonesome because I'm afraid that means the future will wave on, leaving me struggling at the edge of the beach.

RETURN TO PEOPLE. You see, not only do I not understand about computers (put me in a bank job and I'll bankrupt the state in 10 seconds), but worse than that, I seem to be the only one in my group of friends (all two) who has absolutely no interest in taking a computer course. What I am is anti-computer. What I really want to see, waving in the future, is a return to people.

Like at the supermarket — where I was not allowed to bring home my milk, ice cream, cold cuts, and canned tuna fish one evening because the computer broke down.

I arrived at the speed-lane register half an hour before closing time. There were people lined up at all the registers and everything seemed normal until my tuna fish slid across the electronic device and failed to compute.

The cashier slid the can across several times and then checked the coded label.

"Eighty-nine cents," I said. "On sale this week."

"I know," she said, "but it needs to register."

CASHIER UNNERVED. I hated the militant sound of that, but I said nothing while the cashier began punching keys at her machine. She punched away, looking a bit unnerved and then, finally, went to pieces altogether and called out loudly: "Breakdown!"

As I reached out to put a hand on her shoulder, all the other cashiers started shouting "Breakdown" and within seconds it was obvious the whole staff was mobilizing for a crisis. A young manager stepped to the front of the store and said loudly: "The computer will be fixed shortly, folks. Just stay where you are."

Nobody moved. Everything was calm. Well, not everything. My chocolate ice cream was slowly spilling its guts out on the counter top, it not having been too together when I first took it out of a somewhat soggy freezer earlier.

The cashier wiped at the mess and put the ice cream into a plastic bag, whispering conspiratorially, "I'll punch it later."

"I'll never tell," I said.

BASEMENT MICRO. I looked around — and for lack of anything better to do, counted 32 people waiting on all the lines. In a little while, everybody started talking across the counters and the moments mounted. From time to time, the manager issued reassuring bulletins — like, "The computer is in the basement."

His updates made no sense, but they did draw the crowd together in a sense of shared disaster.

Within 20 minutes, people were exchanging names and addresses and promising to meet on line once a year at this exact time.

An old, uncomputerized clock ticked away at the front of the store, heading right for closing time. It still had five minutes to go, unlike my ice cream, which despite the plastic wrapping, was now trickling out of one end of the bag. As I watched it drip through the crevice at the side of the counter, the manager made his last, sobering announcement.

"Sorry, folks," he called out. "Please leave your groceries where they are and depart by the side doors."

DEBAGGED. As he spoke, six bag

boys swung into action like the National Guard, reaching into shopping carts on each line and removing everybody's groceries.

I threw my arms protectively around my few groceries on the counter top and said to the manager who was standing nearby: "I live out in the country."

"Sorry," he said as he commanded his forces through determined eyes: "I can't sell you anything. There is no way of figuring out what you owe."

"Then, just let me take my deli stuff," I begged. "The price is marked right on the packages!"

UNYIELDING MANAGER. "If I do that for you," he said, his eyes never leaving his field of operations, "I'll have to do that for everyone."

I stared at him. "I wish that made sense," I said.

"Just leave your groceries!" the manager called out over my head again to the few remaining grumbling customers.

"The tuna fish is on sale," I said. "Eighty-nine cents."

"I can't sell you anything without the computer," said the manager. "Well then," I sighed, "this is some lousy system."

NUMBER ONE. "I believe we're No. 1 in the state in modern food market technology," said the manager. "We have a failproof backup system, too, but (he looked a bit confused)...uh — sometimes it doesn't work."

He seemed to have startled himself, and at that, he turned to the cashier who was mopping up my ice cream. "Let me try punching the keys again," he said. He leaned across and tried working the keys himself. Nothing pushed.

"Lady," he said, finally, talking to me as if I didn't speak the same language (and he may have been right) "we cannot figure out your grocery bill without the computer. Sorry."

I reached into my purse and grabbed a pencil. I handed it to him. "You may never have tried using this," I said, "but take my word for it, it works."

It was as I was reaching back into my purse to find him a pad of paper that I saw him try to punch the keys with the eraser end of my pencil.

"Sorry, lady," he said. "It doesn't do a thing." ◀

ANNOUNCING...

TWO OF THE HOTTEST NEW GAMES FOR THE MODEL 100

SKY-RAIDER

A fast-paced Action Game with Graphics and Sound that have to be seen to be believed!
Guide your ship across the planet's surface and seek out the deadly Borons, before they destroy you!
#ASG-110 ... Introductory Price ... $14.95

MIND MASTER

A challenging real-time game with superb Graphics and Sound.
Meet with the Master and prepare yourself for one of the most thought provoking games you've ever played!
#ASG-115 ... Introductory Price ... $14.95

BOTH OF THESE PROFESSIONALLY WRITTEN GAMES INCLUDE ALPINE'S EXCLUSIVE "HALL OF FAME" FEATURE. ALSO, IF YOU ACT NOW, YOU CAN TAKE ADVANTAGE OF OUR HOLIDAY SPECIAL*... BOTH GAMES FOR ONLY $24.95

SEND CHECK, MONEY ORDER, OR VISA/M.C. NUMBER. FOR IMMEDIATE DELIVERY CALL OUR 24-HOUR HOTLINE, OR USE OUR NEW COMPUSERVE® EMAIL NUMBER FOR INFORMATION OR CREDIT CARD ORDERS.

COMPUSERVE IS A REGISTERED TRADEMARK OF COMPUSERVE INC., AND H&R BLOCK COMPANY.

*OFFER EXP. JANUARY 1, 1984

ALPINE
DATA SYSTEMS

DEPT. P1 P.O. BOX 1157
ELIZABETH CITY, N.C. 27909

PHONE: (919) 338-2027
EMAIL: 75735, 1440

YES! I'M READY FOR A CHALLENGE!

☐ ASG-110 ____ @ $14.95
☐ ASG-115 ____ @ $14.95
☐ BOTH ____ @ $24.95
☐ CHECK/MO ☐ MC ☐ VISA
SIGNATURE _____
CARD # _____
EXP. DATE ____ INTERBANK # ____
NAME _____
ADDRESS _____
CITY _____ STATE ____ ZIP ____
PLEASE ADD $1.50 SHIPPING & HANDLING
NC RESIDENTS ADD 4% SALES TAX

Circle No. 19 on Reader Service Card

DAVID BUSCH

BUSCH LEAGUE

STRIKE UP A KEGLER'S DEN INSIDE YOUR 100

If there's one game tailor made for the Model 100, it's bowling. It's the kind of game that takes advantage of the Model 100's screen, which is just like a bowling alley — wider than it is deep.

Unlike a real keglers' den, "Bowling" has no gutters. The pins make beep sounds when they fall, rather than loud noises. And in this game, a perfect game adds up to only 270, not 300.

In play, a bowling ball moves up and down at the left side of the screen. You may set the speed of travel to make the game easy or difficult. When you reach the correct position, press any key to release the ball. Depending on where the ball hits the pins, you may get a strike, split, or spare. However, no extra balls are provided after the tenth frame, because of the limitations of displaying more than 10 frames on the Model 100 screen. Scorekeeping is like real bowling.

PROGRAMMING DEVIL. When you roll a spare, your score for that frame increases by the number of pins you hit on your next ball. A strike gives you a bonus of the pins hit on the next two balls. While this scoring system seems simple enough, it was a devil to program. Originally, I set up a series of flags, that kept track of whether the previous ball thrown resulted in a strike or spare, and then went back and added to the score as needed.

Not necessary! Because a computer works so fast, it was much simpler to add up the score from scratch for every single frame. The computer can make the additions over and over in no time at all, so the delay is not noticed. Thus, if a strike is thrown in the first frame, the computer will post a 10, and then add the results for the next two balls — both zero at this point — to arrive at a total score for the first frame of 10.

But, suppose four pins are struck with the first ball of the second frame and three with the last ball of the second frame? After that stanza, when the computer does its addition, it will come up with 17 for the first frame, and a total of 24 for the second — just like in real bowling. The main difference is the partial scores are posted pending throwing of the bonus balls.

The PRINT @ positions of the pins are placed in data lines 310 to 340. These are read and loaded into an array, C(n), and used to print P$ [defined as CHR$(234)] in the correct places to reproduce a setup.

Two balls are thrown each frame, unless a strike is thrown on the first. Variable A is used to keep track of the position of the ball, and this is incremented by DELTA, initially given a value of 40. Thus, while the INKEY$ loop waits for the player to strike a key, A increases by 40 each time, gradually moving the ball down the screen. When it reaches the bottom, DELTA becomes minus 40 and the ball starts back up. This repeats, interrupted only by the delay loop at lines 480 and 500, until the player hits a key.

SCRATCHED PINS BEEP. At this point, A begins incrementing by a value of one, moving it horizontally

10 VARIABLES USED IN BOWLING

A$	Used in INKEY$ loop
A	Position of ball
B(r,c)	Pins struck by each ball thrown
BALL	Loop counter, two balls for each frame
C(n)	Positions of pins
CU	Counter
DELTA	Change of A, ball position
DL	Delay loop
DU	Dummy variable for RND(1)
F	Row ball struck pins
FRAME	Frame
G	Position ball left towards pins
N	Loop counter
P$	Graphic character for pin
SC(n)	Score for each frame, totalled
T	Random pin drop
TR	Total score to this frame
TT	Total pins dropped in a frame

```
10 '***********
20 '* *
30 '* Bowling *
40 '* *
50 '***********
55 '*** Set Random Start Point ***
60 FOR N=1 TO VAL(RIGHT$(TIME$,2))
70 DU=RND(1)
80 NEXT N
85 '*** Instructions ***
90 CLS :PRINT :PRINT
100 PRINTTAB(10)"Instructions?"
110 PRINT :PRINTTAB(14)"Y/N"
120 A$=INKEY$ :IF A$="" "GOTO 120
130 IF A$="Y" OR A$="y"
    THEN GOTO 140 ELSE GOTO 200
140 CLS :PRINT
150 PRINTTAB(6)"Hit any key to release ball"
160 PRINTTAB(6)"Balls thrown per frame appear"
170 PRINTTAB(6)"at left of screen."
180 PRINT:PRINTTAB(12)"= Hit any key =";
190 A$=INKEY$ :IF A$="" GOTO 190
195 '*** Set Speed ***
200 CLS
210 PRINT :PRINT :PRINTTAB(6)"Enter speed desired:"
    :PRINT
220 PRINTTAB(6)"[1] Fast to [9] Slow"
240 DL=VAL(A$)*5
250 DIM B(13,2),SC(13)
260 P$=CHR$(234)
270 CLS
275 '*** Loop through 10 frames ***
280 FOR FRAME=1 TO 10
290 A=1
300 DELTA=40
310 DATA 39,119,199,279
320 DATA 77,157,237
330 DATA 115,195
340 DATA 153
350 FOR N=1 TO 10
360 READ C(N)
370 PRINT@C(N),P$;
380 P(N)=1
390 NEXT N
395 '***Throw Ball ***
400 FOR BALL=1 TO 2
410 A=1
420 DELTA=40
430 A$=INKEY$
440 PRINT@A," ";
450 A=A+DELTA
460 IF A>280 THEN DELTA=-40 :GOTO 450
470 IF A<1 THEN DELTA=40 :GOTO 450
480 FOR N=1 TO DL :NEXT N
490 PRINT@A,"*";
500 FOR N=1 TO DL :NEXT N
510 IF A$="" "GOTO 430
515 '*** Roll Ball toward Pins ***
520 G=A
530 PRINT@A,CHR$(32);
```


Circle No. 20 on Reader Service Card

Special Introductory Offer for M100 Users

Introducing the LAP WARMER GAMES SERIES from SOLITARY SOFTWARE. Games specially designed to load quickly and fit comfortably in your M100 with your working files. Games designed to give you hours of diversion when its just you and your M100.

LAP WARMER GAMES SERIES #1 consists of 4 challenging games:

1. NUMBER CHALLENGE — The M100 picks the number. You need logical skills to deduce it. Over 380,000 possible solutions.
2. MEMORY CHALLENGE — The M100 hides pairs. You find them. 135 options.
3. REPEATER — How long can you keep up with your M100 before your memory snaps?
4. DEFLECTIONS — You fire rays into a grid and use the results to determine where the M100 has placed 4 deflectors.

★ ★ **PLUS 2 BONUS PROGRAMS** ★ ★

BIO-LINES — Know your good and bad days in advance.
WHO BUYS? Drinks or coffee? Your M100 can help you decide.
All games for 8-32k. All on 1 cassette. Special introductory offer — all 4 games plus bonus programs ONLY $19.95
Checks, cash or money order only. Sorry, no charges. Connecticut residents add 7.5% state tax.

SOLITARY SOFTWARE
PO Box 445
Trumbull, CT 06611

TRS-80™

SAVE SALES TAX* PLUS DISCOUNT
*TEXAS RESIDENTS ADD ONLY 4

MODEL 100 32K

FORT WORTH COMPUTERS
WE ARE SERIOUS ABOUT SAVING YOU MONEY
(Located 30 miles from Fort Worth)
377 Plaza • GRANBURY • NR FORT WORTH, TEXAS 76048
TOLL FREE: 1-800-433-S-A-V-E
Monday thru Friday — 9:00 a.m. to 5:00 p.m.
(Order inquiries/Customer Service &) IN TEXAS: 817-573-4111

Circle No. 21 on Reader Service Card

across the screen. A check in line 540 spots collisions with pins and sends the program to a sound routine for a nice beep.

This collision detection has nothing to do with the score, however. Some extra pins are knocked down, their number determined by chance and by where the ball strikes the pins. The screen row is calculated by dividing G — the point where the ball started moving — by 40 and adding one. Various program lines, beginning at 620, erase extra pins.

KNOCKDOWN PEEK. After this, the number of pins knocked down is determined by PEEKing memory, the PRINT @ locations stored in C(n) minus 512. Any spaces found are absent pins. On the second ball, some of the pins knocked down by the first will still be missing. So, the pins hit on the second try are determined by subtracting the pins hit by the first ball from the total gone.

The pins hit by each ball are stored in a two-dimensional array, B(FRAME,BALL). The numbers stored in this array are used to determine the score for each frame (SC(n)) by addition, using the common bowling scoring algorithm outlined previously. Then, the score is printed to the screen and the next frame started.

Unfortunately, because of the width of the Model 100 screen, it is not possible to display more than 10 frames, given the easily obtainable three-digit scores. So, I left the extra balls thrown after the tenth frame out of the program.

```
540 IF PEEK(A-511)=234 THEN GOSUB 1320
550 A=A+1
560 FOR N=1 TO 20 :NEXT N
570 PRINT@A,"*";
580 FOR N=1 TO 20 :NEXT N
590 IF A MOD 40=0 GOTO 610
600 GOTO 530
610 F=INT(G/40)+1

615 '*** Knock Down Extra Pins ***
620 ON F GOTO 630,640,670,740,800,850,900
630 GOTO 930
640 PRINT@C(1)," ";
650 GOSUB 1320
660 GOTO 930
670 PRINT@A(1)," ";
680 GOSUB 1320
690 PRINT@C(3)," ";
700 GOSUB 1320
710 PRINT@C(5)," ";
720 GOSUB 1320
730 GOTO 930
740 FOR N=1 TO 3
750 T=INT(RND(1)*10)+1
760 PRINT@C(T)," ";
770 GOSUB 1320
780 NEXT N
790 GOTO 930
800 FOR N=1 TO 10
810 PRINT@C(N)," ";
820 GOSUB 1320
830 NEXT N
840 GOTO 930

850 PRINT@C(4)," ";
860 GOSUB 1320
870 T=INT(RND(1)*2)
880 IF T=1 THEN PRINT@C(2)," ";:GOSUB 1320
890 GOTO 930
900 T=INT(RND(2))
910 IF T=1 THEN PRINT@C(7)," ":GOSUB 1320
925 '*** Count Downed Pins ***
930 FOR N=1 TO 10
940 IF PEEK(C(N)-512)=32 THEN TT=TT+1
950 NEXT N
960 B(FRAME,BALL)=TT
970 IF BALL=2 THEN B(FRAME,2)=
    B(FRAME,2)-B(FRAME,1)
980 IF B(FRAME,2)=<0 THEN B(FRAME,2)=0
990 PRINT@10,"Pins:";B(FRAME,BALL)
1000 TT=0
1010 CU=CU+1
1020 FOR N=1 TO 500 :NEXT N
1030 IF BALL=2 GOTO 1060
1040 IF G=161 THEN GOTO 1060
1050 NEXT BALL
1055 '*** Add up Score ***
1060 FOR N=1 TO FRAME
1070 SC(N)=B(N,1) :IF B(N,1)=10 GOTO 1110
1080 SC(N)=SC(N)+B(N,2)
1090 IF SC(N)=10 THEN SC(N)=SC(N)+B(N+1,1)
1100 GOTO 1120
1110 SC(N)=SC(N)+B(N+1,1) :IF SC(N)=20 THEN
    SC(N)=SC(N)+B(N+2,1) ELSE
    SC(N)=SC(N)+B(N+1,2)
1120 NEXT N
1125 '*** Print Score on Screen ***
1130 CLS
1140 PRINT@280," ";
1150 FOR N=1 TO 10
1160 IF SC(N)=0 GOTO 1210
1170 TR=TR+SC(N)
1180 TR$=MID$(STR$(TR),2)
1190 PRINT TR$;" ";
1210 NEXT N
1220 RESTORE
1230 A=1
1240 TR=0
1250 NEXT FRAME
1255 '*** Game Over ***
1260 PRINT@55,"Game Over";
1270 PRINT@135,"Play again?"
1280 A$=INKEY$ :IF A$="" GOTO 1280
1290 IF A$="Y" OR A$="y" THEN RUN
1300 CLS
1310 END
1315 '*** Sound Routine ***
1320 SOUND 7000,1
1330 FOR DE=1 TO 50 :NEXT DE
1340 RETURN
```

It's Simple. . . CALL AND SAVE MONEY

1-800-841-0860

CONVENIENT ORDER ENTRY

GA. INFO. 912-377-7120

"Telemarketing Works For You"

commodore

CALL FOR BEST PRICES ON COMMODORE

COMMODORE 64
VIC 1541 DISK DRIVE
VIC 1530 DATASETTE REC.
VIC 1525 GRAPHIC PRINTER
VIC 1520 COLOR PLOTTER
VIC 1600 VIC MODEM
VIC 1701 COLOR 14" MONITOR

COMMODORE 64 SOFTWARE
HESWARE SOFTWARE
WORDPRO PLUS 3

$CALL

TRS-80 COMPUTERS

• PURE RADIO SHACK EQUIPMENT •

UP TO **20%** AND MORE

DISCOUNT

CALL FOR PRICES
ON COMPLETE LINE

IBM COMPATIBLES
YOUR CHOICE
EAGLE PC
COLUMBIA PC
CORONA PC
$CALL

RB ROBOT
RB5X $CALL
ARMATRON
ROBOT ARM
$29

EPSON PRINTERS
FROM **$CALL**

FX-80 ..... SAVE
RX-80 ..... SAVE
FX-100 ..... SAVE

TRS-80 PRINTERS
COMPLETE LINE FROM **$199**

SCM SMITH CORONA
TP-I DAISY WHEEL PRINTER
FROM **$CALL**

Star
GEMINI 10X & 15
PRINTERS
FROM **$279**

C. Itoh
$CALL
Transtar
$CALL

OKIDATA PRINTERS
FROM **$CALL**
MICROLINE SERIES
•83A
•84P •92P •93P
PACEMARK 2350P

MODEMS
Hayes'
Novation
$CALL

MONITORS
USI
TAXAN
$CALL

NOTICE

ALL PRODUCTS WE SELL ARE BRAND NEW AND COVERED BY THE MANUFACTURER'S SPECIFIC WARRANTIES. COPIES AVAILABLE UPON REQUEST.
WE DO NOT SELL ANY USED, RECONDITIONED, FOREIGN OR INFERIOR MODIFIED EQUIPMENT.
PRICES AND PRODUCTS SUBJECT TO CHANGE WITHOUT NOTICE.

QUADRAM CORPORATION
GRAPPLER+

FRANKLIN
Albert
COMPUTERS
$CALL

FREE

UPON REQUEST
•DISCOUNT PRICE LIST &
INFORMATION KIT
WRITE
MICRO MANAGEMENT SYSTEMS
TELEMARKET DEPT. #

AST & COLORPLUS BOARDS
$CALL

Verbatim
NEW PRODUCTS
$CALL

Since 1978

- PIONEER IN DIRECT TO CONSUMER SALES OF MICRO COMPUTERS AND ELECTRONICS
- NAME BRAND PRODUCTS
- LARGE INVENTORIES
- NEXT DAY SHIPMENT ON MOST PRODUCTS

Man's Best Friend

Micro Management Systems, Inc.
2803 Thomasville Road East
Cairo, Georgia 31728
(912) 377-7120

DISCOUNT PRICES

BUY DIRECT

TELEMARKET DEPT. 100

Circle No. 22 on Reader Service Card

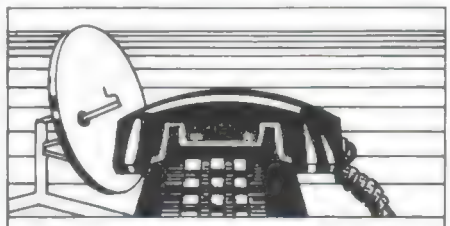
WANTED
YOUNG MICRO
WITH DISK DRIVE
FREE KITTENS
REAL
MICRO-CATS
CALL
8-1212
JP
WAS
HERE
PORTABLE 100
CLUB
MEETS WEDNESDAY
7:30 PM
22 HILLVIEW AVE.

A USER'S GUIDE TO BULLETIN BOARD SYSTEMS

The nation's major bulletin board watcher takes you on a tour of BBS America.

By JIM CAMBRON

Editor's Note: This article is excerpted from Jim Cambron's forthcoming book, Microcomputer Telecommunications. *It is excerpted here with permission from Tab Books.*



The development of microcomputer bulletin board systems is the story of microcomputing as a hobby and the debate over establishing a standard of communications between microcomputers.

In the mid-70s several manufacturers and publishing companies attempted to establish a data-storage standard. The standard would make it possible for software writers to create a single version of a Basic program that could load and execute on a wide variety of computers.

The companies met in Kansas City, MO, and developed the Kansas City Standard, a system of program and data storage for audio tape. Touted as a universal standard for software, the standard became obsolete before its use became widespread because floppy disk storage became a more popular means of offline storage.

KC STANDARD NIXED. As the cost of micrcomputers fell, manufacturers integrated floppy-disk storage into their systems in an effort to reduce production costs and create a "captive market" for their add-on disk systems. Each established its own data formatting scheme and proprietary disk operating system. The result: an almost total lack of a standardized format for floppy disk storage and, seemingly, the end of a universal standard for software exchange.

In 1978, Ward Christensen and Randy Suess created the first microcomputer BBS — CBBS. By recognizing nearly every computer spoke ASCII (American Standard Character Information Interchange) and could be programmed to act like a communications terminal, Christensen and Suess almost inadvertantly created the sought-after universal standard!

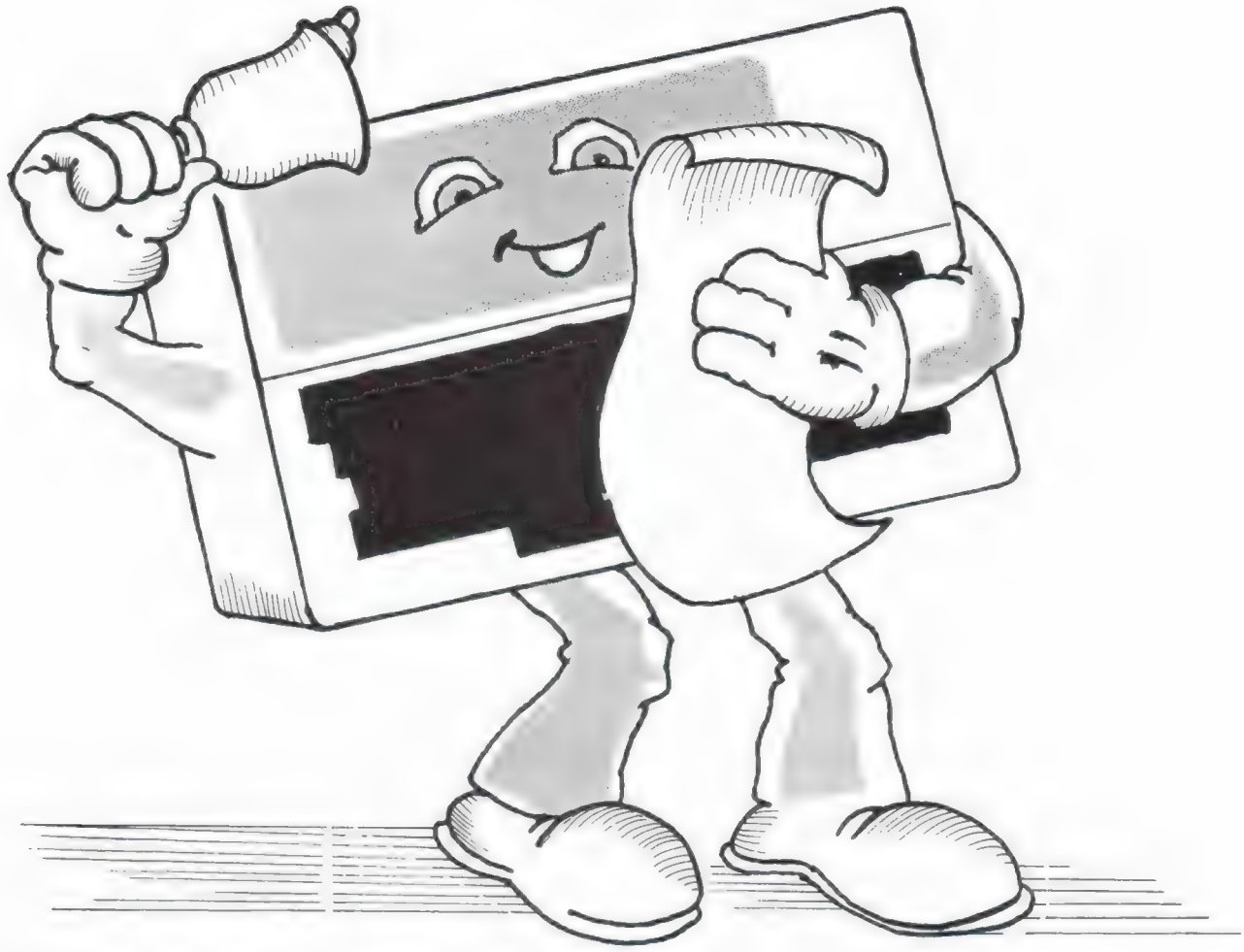
Computerists could exchange programs and ideas with each other without hassling with hardware compatibility. And the reliability of Ma Bell's nation-wide telephone system made transcontinental data exchanges to any location possible.

It's important to note the acronym CBBS is actually a trademark, not a generic term for bulletin board systems. CBBS should be used only when referring to Christensen's and Suess's Computerized Bulletin Board System software.

48K MINIMUM. Bulletin Board Systems (BBSs) operate on a microcomputer equipped with: 48K or more memory, one or more disk drives, a printer, a serial interface, an auto-answer modem, and a special bulletin board program written for the microcomputer used.

Bulletin board software is pretty complicated — each type of computer must have its own. There are a variety of software packages for many brands of micros — ABBS (Apple II/IIe), Bullet-80 (TRS-80 model I-III), CBBS (CP/M systems), Forum-80 (TRS-80 models I-III), OCCCS (Radio Shack Color Computer), PMS (Apple II/IIe), and RCPM (CP/M systems).

Generally speaking, bulletin boards can be accessed by one user at



a time. Other users must wait to access the system.

The typical BBS is comparable to the cork bulletin board at the local supermarket or laundromat. People leave and read messages as they wish. Beyond that, the BBS has its own truly unique identity. BBSs are an open forum of two-way communication and often contain messages of a less commercial nature than "Free Kittens" or "House Painting Done Cheap." Typical messages range from a simple "Hello, how are you?" to hardware and software questions and answers, or continuing multi-message exchanges between users on nearly any subject. Most messages, however, are about computers and related topics.

E-MEETING. Futurists predict that as technology puts data communications within economic reach of every citizen, discussion on the boards will drift from computers to community issues — ultimately to where "town meetings" will be conducted through a bulletin board system.

Bulletin boards also offer data bases containing public domain programs or information you can transfer to your computer. A typical example is the on-line availability of the entire CP/M Users Group Library via RCPM (Remote CP/M) BBSs operating nationwide. Other BBSs are operated by computer clubs and users groups and contain information about a particular computer, programming language, or popular software package.

Companies use BBSs to exchange interoffice information and in the case of software and hardware companies, communicate directly with their customers. Typesetting companies and publishing houses use modified versions of BBS software to process text and manuscripts. The potential uses are unlimited.

LOGON. Logging onto a BBS is easy. Once you have dialed the system's phone number and the connection has been made, press return a few times. This may not be necessary on some BBSs. Forum-80 automatically sends a sign-on message when connection has been made.

A greeting message will be displayed identifying the system followed by some sort of sign-on procedure. This usually involves entering your name, city and state, and telephone number. Some BBSs will ask for a previously-established, sign-on password. If you do not have a sign-on password, press N and return, or just return to bypass this question. If the BBS won't let you go any further, then you need to get a password assigned to you. Personally speaking, BBSs requiring preassigned passwords are usually not very interesting.

Many BBSs can assign you a sign-on password if you plan to use the BBS frequently. This type of password lets you skip by the name and city questions. Other BBSs may offer a registered password used to verify your identity.

Once you have identified yourself, the BBS will check its user log to see if you have been on the system before. If so, you will be notified of any messages addressed to you. The user log is able to do this by comparing the sign-on information you entered to a list of previous sign-ons. If you sign on *exactly* the same way

every time, the system will be able to find messages left by others addressed to you.

TRIAL AND ERROR. You can use the auto-logon feature of the 100's telecommunications software (described on page 90 of the Model 100 manual) to log onto many BBSs. Since there's no BBS standard, you will have to develop your auto-logon string by trial and error. It is an art that, above all, requires patience.

Nearly all the over 450 BBSs running in the United States are menu-driven. You sign on and are given a menu of activities — commonly called the command or function mode. At this point, you are able to enter one-letter commands to use the system. Each type of BBS has a unique set of commands. Fortunately, the most common commands are universally named. Here's an overview of them:

The enter (E) command lets you store a message on the BBS for other users to read. Message entry is usually done a line at a time. Once a message is entered, you're given the option to edit the message, save it, or abort and return to the command mode. Each message is assigned a unique message number for retrieval. In addition, most BBSs let you send private messages protected by passwords.

GETTING MESSAGES. The retrieve (R) command lets you read messages entered by others. Many BBSs enable you to view messages in the chronological order. Some allow viewing in reverse chronological order and all messages entered since you last signed on. Some BBSs allow these options to be input as arguments appended to the R command. For example: R;F or R +; where R is the retrieve command and F or + is the forward argument.

Each BBS has its own way of doing things. While F is a valid argument for forward retrieval on Forum-80, + is used on PMS . Unfortunately, command arguments are not standardized from one type of BBS to another. It is something we all have to live with.

The goodbye (G) command allows you to gracefully exit the system and end the telephone call. On some BBSs, this command is known as terminate (T). Courtesy and common sense dictate this command should always be used to end a session. On rare occasions you may crash the system hanging up on it.

Configuration commands make the BBS adapt to the way your equipment and software work. Here are a few examples:

The line feed (L) command makes the BBS start or stop sending a line feed after every carriage return. If received text appears to be double spaced, stop the transmission of line feeds after carriage returns. This will cause text to be single spaced. If text is constantly overwritten on the same line making text unreadable, then line feeds are necessary.

GETTING TO CASES. The case (C) command lets you switch from uppercase display of characters to upper- and lowercase — providing your computer is capable of handling upper- and lowercase.

The width (W) command lets you establish a line length suitable for your display. If, for example, the BBS contains text formatted in 64-character lines, and your display is 40 characters wide, text will wrap around after 40 characters, making it hard to read. Use the W command and force the BBS to send 40-character lines.

The nulls (N) command lets you set the number of null characters to be transmitted after every carriage return. The null (NUL) character is a special ASCII character used for timing purposes and isn't printed. This command can be handy if the you have a slow printer online. Otherwise, *specify zero (0) nulls!* Nulls can drastically cut your rate of data transmission. Use nulls sparingly and when in doubt, specify zero.

DOWNLOADING. The download command sets up the BBS for file transfer of, hopefully, public domain software. Bulletin boards have various ways of handling this process. The most common method is data capture.

To capture data, you need terminal software that puts incoming data into a memory buffer for transfer to disk or tape. In the case of the Model 100, a document (.DO) file is created. Most BBSs use a set of control

Circle No. 23 on Reader Service Card

MAGNIFICENT 7 PROGRAM PACKAGE

1. **Bank Finance**
   Six Functions — it will keep your interest
2. **Calendar**
   It's forever!
3. **Sliding Numbers**
   One or two players — graphics & sound
4. **Bio-Rhythm**
   Graphic sine wave
5. **Vegas Slots**
   Even the arm moves! — graphics & sound.
6. **Vegas Black Jack**
   Dealer's hole card face up or down — graphics & sound
7. **Vegas Five Card Draw Poker**
   Most popular machine in Vegas — graphics & sound

FEATURES:

- Professional quality
- Rapid response
- Minimum use of memory
- Eye-popping graphics with synchronized sound effect
- Audio cassette instruction for each program
- Minimum hardware requirements 8K — Model 10 with cassette recorder

Entire collection only **$19.95** plus $2.00 shipping & handling (U.S.), $5.00 shipping & handling (Foreign). Indiana residents add 5% sales tax. Visa & M.C. accepted, check & money order.

Complete
Computer Services
8188 Heather Drive
Newburgh, IN 47630
(812) 853-5140

Circle No. 24 on Reader Service Card

YORK 10™
CASSETTES

• LOWER PRICES
• LONGER LENGTHS

DATA TRAC C-06, C-12, C-24

From the leading supplier of Computer Grade Cassettes, new, longer length C-12's (6 minutes per side) provide the extra few feet needed for some 16K programs.

Premium 5-screw shell with leader — BASF tape
Error Free • Money back Guarantee

	C-06	C-12	C-24	HARD BOX
1 Dozen	7.00	7.50	9.00	2.50
2 Dozen	13.00	14.00	17.00	4.00

500 C-12's—38¢ each • w/labels add 4¢
Shipping $17/ 500
500 Boxes 13¢ ea • shipping $10/ 500

SHIPPING/HANDLING $3.50
Any quantity (except 500 special)
NOTE: Outside 48 Contin. States shipping $3.50 PLUS $1 per caddy; per dozen cassettes; per dozen boxes; per 10 discs. In Cont. U.S. shipments are by UPS unless Parcel Post requested. California residents add Sales Tax

WRITE FOR FREE BROCHURE
for IMMEDIATE SHIPMENT on Credit Card Orders
Call: 213/700-0330

YORK 10™ Computerware
9525 Vassar Ave. #P2 Chatsworth, CA 91311

codes to open your buffer at the right time, eliminating the possibility of capturing garbage at the beginning and end of a downloaded file. While the Model 100 is not equipped to respond to these commands, it is possible to edit out the garbage afterwards.

Data capturing requires that all files be transmitted in printable ASCII characters rather than compressed binary. Basic interpreters often convert statements into one-byte tokens to save space in memory and on disk. These tokens vary between brands of microcomputers. And sometimes terminal software mistakes the tokens for control characters. This can have disastrous results! Fortunately, Model 100 Basic programs can be saved in ASCII format (SAVE "RAM:FILENAME.").

The same problem exists with binary files containing programs written in machine language or compiled into run modules. The BBS transmits binary files in ASCII form. A byte with a hex value of 0D (an ASCII carriage return) is transmitted as two ASCII characters — 0 (hex value 30) and D (hex value 44). The conversion doubles the size of the file. While most terminal communications packages include a utility to convert ASCII machine-language files back to binary, Telcom does not.

PROTOCOLS. Other methods of data capture, called protocols, exist, the most popular and most imitated being MODEM. Developed by Christensen, MODEM can transfer files in binary or ASCII format without modification. MODEM also provides an error checking system that eliminates transmission errors sometimes experienced by the data capture technique and is used almost exclusively by CP/M-based BBSs. It is invoked from the CP/M operating system rather than from the BBS system itself and requires a special terminal program variously called MODEM, MODEM7, MODEM7A or TMODEM. MODEM software is public domain and can be found in source or assembled form in the CP/M Users Group Library. A detailed description of the MODEM protocol is also available.

While uploading is generally considered the opposite of downloading, it involves a different process.

AUTOPLOT for the TRS-80

MODEL 100 (16k+)

and the CGP-115 Color Graphic Printer

A picture is worth a thousand words. Now you can produce color graphs of professional quality effortlessly in minutes wherever you go. Plot tabulated data or functions. Choose from line graphs, scatter plots, bar graphs and more. Axes are automatically scaled and labelled. A few keystrokes select from many options, such as plot size, continuous curves and/or separate marks, multiple curves, optional grid overlay, linear or log plots, numeric integration or differentiation. . . A label-maker program lets you add fancy titles or legends. AUTOPLOT is written in BASIC and comes on cassette, together with an exceptionally clear 28-page manual.

Why such a small ad for such a fantastic program? By keeping down our overhead, we can offer you AUTOPLOT at the unheard-of introductory price of $39.50 (Offer expires 12/15/83)

Also available:

AUTOPLOT for TRS-80 Model I/III (48k, 1 disk and CGP-115....$69.50

AUTOPLOT for TRS-80 Model I/III and EPSON printer with Graphtrax...$79.50

AUTOPLOT for LNW-80 (+ Hi-Res video graphics)....$99.50

Please add $3.00 for shipping and handling CA residents please add sales tax. Phone orders, VISA and MASTERCARD welcome.

MENLO SYSTEMS
3790 El Camino Real, Suite 221
Palo Alto, CA 94306, Tel (415) 856-0727

TRS-80, CGP-115: TM of Tandy Corp

Circle No. 25 on Reader Service Card

Bulletin boards generally operate without large capture buffers. To avoid this problem, BBSs upload programs a line at a time. The line must always end with a carriage return and typically should not be more than 80 characters in length.

When the system receives a line it transfers it to disk, and sends a prompt character to your computer indicating it is ready for another line. Your terminal program must be equipped to transmit a line at a time, waiting for a prompt character before transmitting the next line. As with downloading, all upload data must be represented in printable ASCII characters.

Many BBSs also use the X-ON/X-OFF protocol to receive large text files without embedded carriage returns. The Model 100 is designed to use this protocol. To do so, you must initialize the status parameter to E.

OTHER COMMANDS. There are other commands available on BBS systems. Unfortunately, many are without standard names. Here is a summary of them:

Search lets you look for a specific message by subject or author. You can also search a user list maintained by the BBS for a particular user.

Expert mode eliminates helpful but time-consuming prompts transmitted by the BBS.

Time and date let you find the current time, date, and your elapsed time on the system.

You can see a summary of messages on a BBS by scanning the headers (containing the subject, author, and date entered) of active messages in the system.

CHAT. With chat, you may talk directly with the system operator (also known as the SYSOP) through the keyboard. The system operator, if present, will respond via the BBS console keyboard.

List other systems will give you more BBS telephone numbers to call. The information is usually transmitted in printer format for your convenience.

Information about the system will describe the hardware and software used by the BBS.

Other commands offering product ordering, registration for passwords, printer-formatted calendars, and access to restricted features.

More information on bulletin board systems, communications products, and technology is available in the *On-Line Computer Telephone Directory*, a quarterly publication devoted exclusively to microcomputer telecommunication. Each issue contains an updated and verified list of over 300 free-access bulletin board system telephone numbers around the world. Subscription rates are $9.95 for one year, $15.95 for two years. Single issue copies are available for $2.85. Write to: OLC-TD, Department PCA, P.O. Box 10005, Kansas City, MO 64111.

Jim Cambron is the publisher of The On-Line Computer Telephone Directory, *considered by many computerists to be the directory of bulletin boards in the nation.*

SOME WAY STATIONS ON THE NETWORK NATION

Phone Number	Type	Location
(619) 561-7277	PMS	Santee, CA
(312) 545-8086	CBBS	Chicago, IL
(816) 861-7040	Forum-80	Kansas City, MO
(816) 358-6222	OCCCS	Kansas City, MO
(213) 360-5053	RCPM RBBS	Los Angeles, CA
(201) 775-8705	RCPM RBBS	OCEAN, NJ
(203) 744-4644	Bullet-80	Danbury, CT
(201) 694-7425	—	Wayne, NJ
(313) 978-8087	AMIS	Sterling Heights, MI
(317) 255-5435	—	Indianapolis, IN

Attention Subscribers!

All correspondence concerning your subscription, i.e., changes of address, duplicate copies, etc. should be sent to *Portable 100*, PO Box 468, Hasbrouck Heights, NJ 07604. Please include your mailing label for speedy service.

THE MSTRAP™

MAKES YOUR MODEL 100 EASY TO CARRY

The MSTRAP provides the Model 100 user with a convenient way to hand or shoulder carry their Model 100. Conversion from hand to shoulder carry and back again takes only a few seconds
Installation of the MSTRAP will not void any of Tandy's warranties and can be performed by the purchaser in just a few minutes
The MSTRAP comes with full instructions and has a lifetime guarantee.

ONLY $12.00

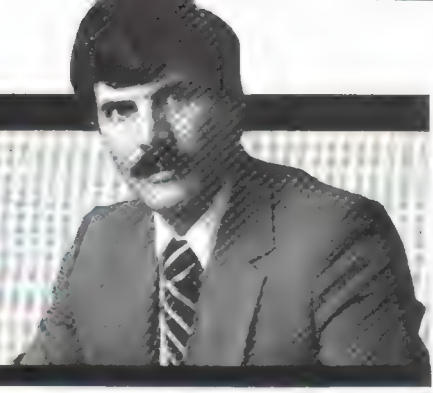
POSTAGE & HANDLING INCLUDED

THE DONALD STEPHENS COMPANY
Hardware & Software
M100 Model
1962 Pommel Avenue
Las Vegas, Nevada 89119
(702) 739-6113

Circle No. 27 on Reader Service Card

BILL LOUDEN

TELECOMPUTING



TURN YOUR MODEL 100 INTO AN AUTOMATIC MAILMAN WITH THIS CIS OFFERING

At 6 a.m. my Model 100 "woke-up," dialed the local CompuServe phone number, sent my pre-composed e-mail and downloaded my waiting e-mail. What was I doing at 6 a.m.? I was still asleep!

With a new program for the Model 100 and a special CompuServe Model 100 E-mail host program, you can now send and receive your e-mail automatically. The Model 100 E-mailer Basic program was written by A. B. (Sandy) Trevor, executive vice president of computer resources at CompuServe.

MULTIPLE LETTERS. E-mail is CompuServe's electronic mail utility. Its only fault is it is menu driven and sending or receiving multiple letters is tedious with the menus.

The Model 100 E-mailer program allows you to create and read your e-mail messages off line saving you valuable connect time. The program will automatically start up at the time you specify, log into CompuServe, go to e-mail, upload any messages that you created earlier off line, and then download any waiting mail. And by setting the start up time prior to 8 a.m., you are still paying for CompuServe's standard rates.

E-mailer also has the capability of up or downloading Scripsit or Model 100 text files that have 'long' lines. CompuServe normally requires a carriage return after each line, and lines cannot be longer than 132 characters. Scripsit and Model 100 text files normally use a carriage return to separate paragraphs in documents.

NEED 16K. E-mailer is designed primarily for 16K or greater Model 100s but may also be used on 8K machines with certain changes (discussed later).

To use E-mailer, you must have "cis:" (lowercase) as an entry in ADRS.DO. "cis:" must contain the local CompuServe phone number, your user identification number, and password. A typical entry in ADRS.DO may look like this:

```
cis:4572105<=^C?U71234,567
^M?PYOUR*PASSWORD^M>
```

You must also have your CompuServe settings to VIDTEX and your initial entry page to Videotex on CIS. If your initial entry page is set to the programming area, your ADRS.DO file should include TOP M as follows:

```
cis:4572105<=^C?U71234,567
^M?P YOUR PASSWORD^MTOP
^M>
```

MAIL.DO. Use the Model 100 TEXT editor and create a file called MAIL.DO. This will be the mail file sent to CompuServe for e-mail delivery. Each message in the file must have a three-line header in e-mail format containing the user ID of the addressee, your name, and the subject. A typical message may look like:

```
To: 71234,567
Fr: Bill
Sb: Model 100
John, I submitted my program to the
Model 100 SIG yesterday. Did you
get it yet?
Bill
```

You may send multiple messages by separating each message in MAIL.DO by GRAPH F. Each message, however, must have a three-line header.

Any mail waiting on CompuServe will be downloaded into a file named MAILIN.DO on your Model 100. E-mailer is that simple!

ERROR 7. If your e-mail is too big to fit into your Model 100's memory, E-mailer will stop with an error 7. If this happens, no messages will be deleted from CompuServe (not even those that may have been successfully downloaded) so you will not lose any e-mail.

Although the program will run on 8K Model 100s, there is very little room for messages. If you have an 8K machine, you can reduce the program size by deleting all remark statements from the program and the auto-start feature (lines 22–32).

E-mailer requires access to the programming area on CompuServe. Most user accounts do not have access to this area during prime time hours. Use the auto-start feature to access CompuServe during non-prime hours (6 p.m. to 8 a.m.) when the rates are cheaper.

CompuServe would be interested in other applications, uses, or modifications to this program. You may send your enhancements to the Personal Computing Product Manager c/o CompuServe.

Note this program is copyrighted by CompuServe but has been made available for your personal use.

Bill Louden is the product manager for personal computer services for the CompuServe Information Service. He sponsors the Model 100 SIG on CIS.

A LINE BY LINE ACCOUNT OF E-MAILER

Here's how CompuServe's E-mailer program works:

Line 15 sets SM=0 to delete your Model 100 MAIL.DO file after it is sent to CompuServe. This is recommended, as it will free your Model 100 memory for the incoming mail. Set SE=1 to delete your mail on CompuServe after it is sent to your Model 100. If you don't, you will get the same mail next time you call CIS.

Lines 16–21 open the ADRS.DO file and searches for your entry "cis:". The "cis:" entry in ADRS.DO must be in lowercase. Line 20 appends "?!pro" to your "cis:" entry which will instruct CompuServe to enter the programming area after it receives the ! prompt. If your initial page is already set to the programming area, you must append "TOP M" to your "cis:" entry as shown above. E-mailer waits for the ! prompt from the Videotex area before continuing. Line 21 sets the variable M to be the address of the string variable SG$ and points to the beginning memory location where the actual characters in SG$ are stored.

Lines 22–32 are optional. They allow you to preset an auto-start time for E-mailer. When the program is run, it will cycle through lines 24–26 until the set time.

Lines 32-34 open the modem as a file and sets its status to 711E. This may be different than your normal setting as E-mailer ignores parity.

Lines 35–36 open the file MAIL.DO to send your mail. If the file does not exist, an error is displayed and the program branches to line 54.

Lines 37–41 read in the three-line header in the file MAIL.DO. If it is not in the correct format, an error is displayed and the program stops.

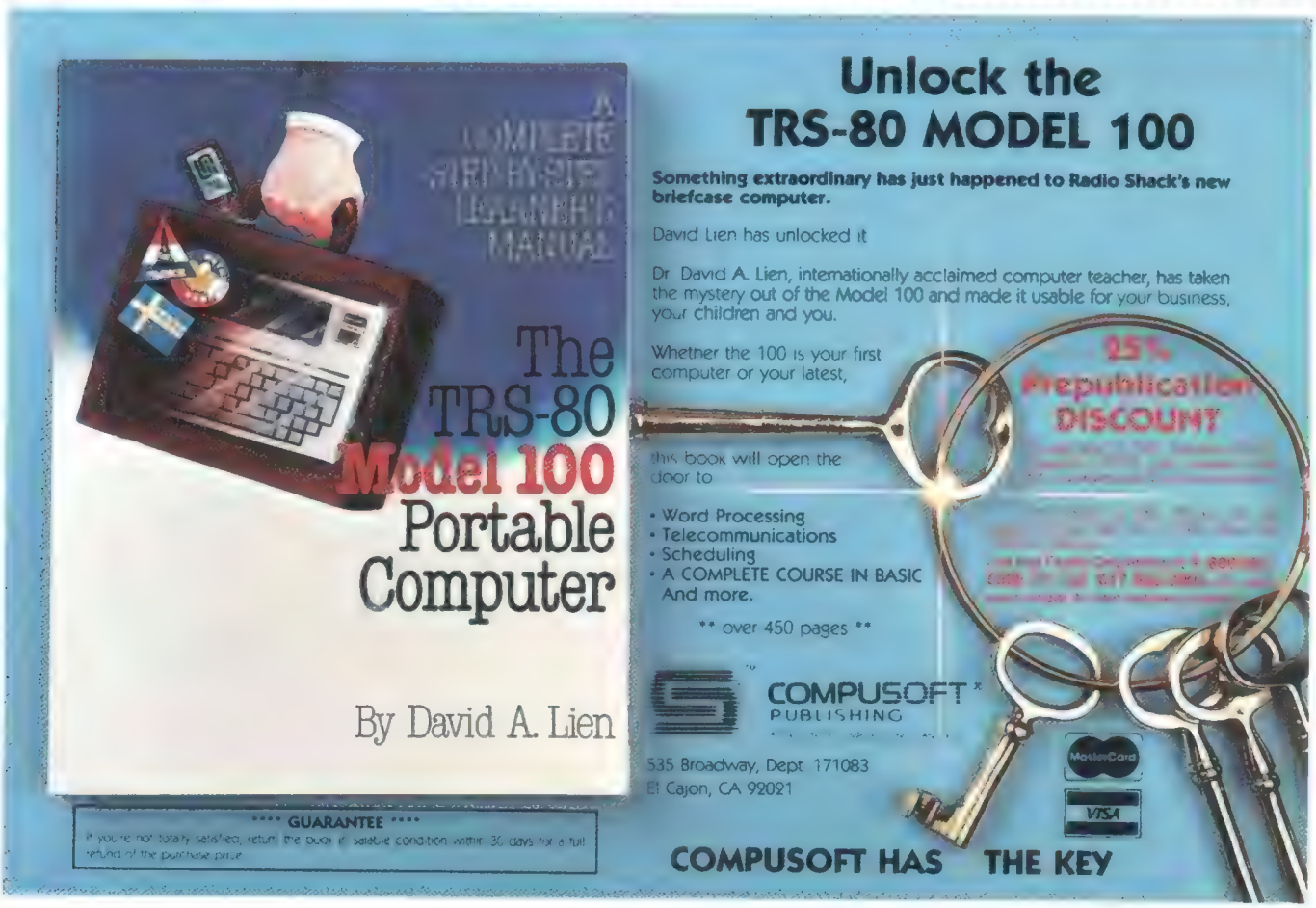
Lines 42–53 run the SNDMAL program on CompuServe which allows you to directly send multiple e-mail messages. If GRAPH F is encountered, E-mailer branches to line 37 for the next message to send. Once all mail is sent line 53 will delete or retain file MAIL.DO depending on the value of SM. If SM=0, MAIL.DO is deleted; with any other value MAIL.DO is retained.

Lines 54-65 run a CompuServe program called EMADMP which will access your e-mail messages. Lines 55-56 open the file MAIL-IN.DO and append new mail. If the programming prompt OK is not detected in line 59, E-mailer will delete or retain the e-mail depending on the setting of SE in line 61. IF SE=0, the EMAIL.DAT file on CompuServe will be deleted; with any other value it will be retained.

Lines 62-63 will lower the protection of your CompuServe EMAIL.DAT file and delete it. Line 65 will log off CompuServe, and the CALL 21179 will disconnect the phone line.

```
1 CLS
  :?:?"CompuServe EMAILer"
2 'For TRS-80 Model 100 by A. Trevor
3 'Copyright 1983, CompuServe Inc.
4 'v.58
5 'Sends from MAIL.DO; format:
6 'To: (Destination User ID)
7 'From: (Your Name)
8 'Subj: (Up to 32 chars)
9 'Text
10 '(Graph-F separates messages)
11 'ADRS.DO entry:
12 'cis:5552105<=   C?U70000,0   M?Ppassword
   M>
13 MAXFILES=3
   :CLEAR 600
   :DIM HL$(3)
   :DEFINT C,I,S
14 'Set SM=0 to kill MAIL.DO after mailing; SE<>0 to
   save EMAIL on CIS
15 SM=1
   :SE=0
16 E$=CHR$(27)
   :SOUND ON
   :ON ERROR GOTO68
17 OPEN "ADRS"FOR INPUT AS3
18 IF EOF(3)THEN ?"cis:"+CHR$(128)+"   not in ADRS"
   :STOP
19 LINEINPUT#3,LG$
   :IF LEFT$(LG$,4)<>"cis:"THEN18
20 LG$=MID$(LG$,5,LEN(LG$)-5)+"?!pro   m?O>"
21 M=VARPTR(LG$)
   :AD=PEEK(M+1)+(PEEK(M+2)*256)
   :CLOSE 3
22 ONERROR GOTO30
23 ?@61,"Time:"
   :?@165,"Mail time, or (N)ow:";
   :N=186
   :L=0:T$=""
24 ?@N,CHR$(239)
   :?@67,TIME$
   :A$=INKEY$
```

```
    :IFA$="THEN24ELSE?@N," ";
    :C=ASC(A$)
    :IFC=13THEN27
25  IFC<>8ANDC<>29ANDC<>127THENL=L+1
    :T$=T$+A$
    :?@N,A$;
    :N=N+1ELSEIFL>0THENL=L-1
    :T$=LEFT$(T$,L)
    :N=N-1
    :?@N," ";
26  GOTO24
27  IFLEN(T$)<2THEN32
28  ONTIME$=T$GOSUB31
    :TIMEON
    :I=0
    :?@165,E$;"pAuto-mail set for
    ";T$;E$;"q"
29  ?@67,TIME$;
    :IFI=0THEN29ELSE32
30  BEEP
    :?@280,"?Illegal time";T$;
    :RESUME23
31  I=1
    :TIMEOFF
    :RETURN
32  FORI=14000TO1000STEP-999
    :SOUNDI,3
    :NEXT
    :CLS
33  CALL21200
    :CALL21293,0,AD
    :SOUNDOFF
    :ONERRORGOTO74
34  OPEN"MDM
    :711E"FORINPUTAS1
    :OPEN"MDM
    :711E"FOROUTPUTAS2
35  SOUNDON
    :ONERRORGOTO73
36  OPEN"MAIL.DO"FORINPUTAS3
37  FORI=1TO3
38  IFEOF(3)THEN72
39  LINEINPUT#3,LN$
    :C=INSTR(1,LN$,":")
40  IFC=0THEN38ELSEHL$(I)=MID$(LN$,C+1)
41  NEXT
42  ?#2,"RSNDMAL"
    :W$="Nam"
    :GOSUB70
43  ?#2,"tty:"
    :W$="E"
    :GOSUB70
44  IFEOF(3)THEN47
45  C$=INPUT$(1,3)
    :IFC$=CHR$(130)THEN47
46  ?#2,C$;
    :?INPUT$(1,1);
    :GOTO44
47  ?#2,CHR$(26);
```

Circle No. 28 on Reader Service Card

```
48 W$="S"
   :GOSUB70
   :?#2,HL$(1)
   :GOSUB70
   :?#2,HL$(3)
50 W$="N"
   :GOSUB70
   :?#2,HL$(2)
   :W$="OK"
   :GOSUB70
52 IF C$=CHR$(130)THEN37
53 IF SM THEN ?ES;"pMAIL.DO retained"
   ELSE KILL"MAIL.DO"
   :?ES;"pMAIL.DO deleted"
54 'Read
55 ?"Read EMAIL";ES;"q"
   :CLOSE 3
   :ON ERROR GOTO74
56 OPEN"mailin.do"FOR APPEND AS3
   :?#3,DAYS,TIMES
57 ?#2,"r 'emadmp"
   :LINEINPUT#1,LNS:OS=""
58 C$=INPUT$(1,1)
   :?C$;
   :?#3,C$;

59 O$=RIGHT$(O$,4)+C$
   :IF O$<>CHR$(10)+"OK"+CHR$(13)+CHR$(10)
   THEN58
61 IF SE THEN65
62 ?#2,"pro (4)email.dat":W$="OK"
   :GOSUB70
63 ?#2,"del email.dat"
   :GOSUB70
64 ?ES;"pOld EMAIL deleted";ES;"q"
65 ?#2,"OFF"
   :W$="C"
   :GOSUB70
   :CLOSE
   :CALL 21179
66 ?ES;"pMail ready in MAILIN.DO";ES;"q"
67 FOR I=999 TO 14000 STEP 500
   :SOUND I,3
   :NEXT I
   :MENU

68 ?"? No ADRS file"
   :STOP
69 'Wait on W$
70 LINEINPUT#1,PR$
   :?PR$
   :IF LEFT$(PR$,LEN(W$))=W$ THEN RETURN ELSE70
71 'Errors
72 ?"? Format error in MAIL.DO"
   :GOTO75
73 IF ERR=52 THEN ?ES;"pNo outgoing mail"
   :RESUME54
74 ?"Error";ERR
75 BEEP
   :CLOSE
```

ALPHA/100

161 North Main Street,
P.O. Box 112,
Lake Elsinore, Ca. 92330
(714) 674-6630

YES! Send me:

☐ BAR CODE READER $129.95
☐ LEATHER CASE $109.95
☐ CHECK / MO Include 6% State Tax / Ca. Res.
☐ VISA ☐ MC $3.00 for Shipping & Handling.

NAME _____ SIGNATURE _____

ADDRESS _____ CARD # _____

_____ ZIP _____ PHONE ( ) _____

Circle No. 29 on Reader Service Card

What the home computer was really meant for.

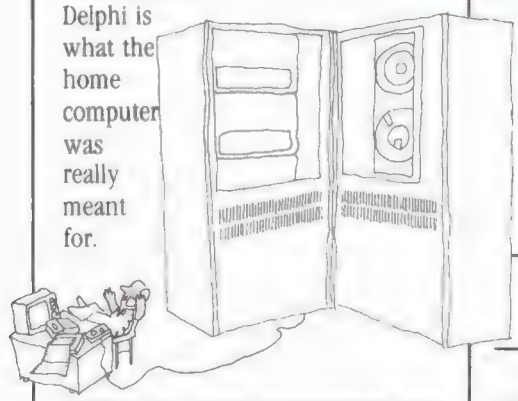
Your Home Computer Is Just The Beginning.

You've got your home finances organized, learned a little French, played a lot of Zork. You have all the software you want.

Yet, something is missing.

Introducing Delphi™. The information, communications and entertainment system that takes you far beyond the limitations of disks and cartridges. The system that's so friendly the whole family can use and enjoy it.

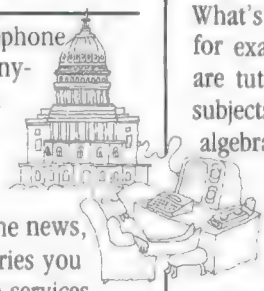
Delphi is what the home computer was really meant for.



Here's What Delphi Gives You Now.

With a simple telephone call, you can look up anything in a vast research library which includes a 20,000-entry encyclopedia. You can do your banking. Get the news, weather and sports stories you want from several wire services. Check airline schedules and make reservations. Shop from an electronic catalog. Tap into the Comp-U-Store* discount shopping service. Keep track of your appointments. Play games. Get in touch with other people through the electronic bulletin board, mail and "talk" services. Seek advice from other members and volunteer your own expertise. Collaborate on the Delphi novels. Take part in or run a subscriber poll.

That's just the beginning.



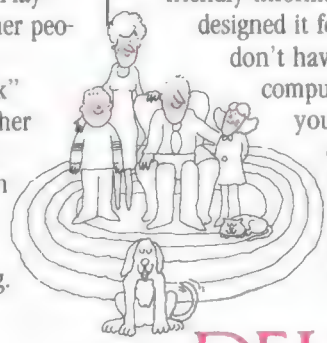
You Can Be Part Of The Design Committee.

We're continually adding new services. But only services we think you and your family will use and enjoy. What's coming, for example, are tutorials on subjects from algebra to zoology.

You can be part of the design committee. Just tell us what you'd like to see on Delphi.

So Friendly, You Don't Even Need Our Handbook.

Delphi is the easy-to-use, friendly information system. We designed it for humans. You don't have to speak computerese. In fact, you don't even need our friendly handbook. We'll take you on a guided tour right on your screen.



The Price Is Friendly, Too.

It's just $49.95 to establish your Delphi membership and for the handbook to get you started. Then just as little as 85 cents for 10 minutes ($5 per hour) on-line for most services during home time . . . evenings, weekends and holidays. Office time, of course, is more.

Delphi Is Compatible With Your Equipment.

No matter what home computer you have, you can use Delphi. Unlike other systems, Delphi is compatible with all makes and is easily adaptable to any screen size. And you can use just about any acoustic coupler or direct connect modem to connect Delphi to your telephone.

We Protect Your Privacy.

We designed privacy into Delphi from the start. Our password system prevents unauthorized access. We don't even know your password, and you can change it any time. We can't monitor your transactions or communications. We can't retrieve information except at your request. The safeguards are spelled out in our policy statement and agreed to by our people. A copy is available. We are members of and subscribe to the policies of the Videotex Industry Association.

Sign Up, Log On, Be In Touch.

To sign up and log on, or for more information, just see your dealer. Or get in touch with Delphi.

We'll put your computer in touch with destiny.

*Comp-U-Store is a registered trademark of Comp-U-Card of America.

DELPHI™

What the home computer was really meant for.

General Videotex Corporation, 3 Blackstone St., P.O. Box 2367, Cambridge, MA 02238 (617) 491-3393

TERRY KEPNER

FULL-DUPLEX

Editor's Note: Full-Duplex is dedicated to solving readers' Model 100 problems. This issue, Terry Kepner will be answering some questions on the 100 that have popped up since he's had his machine. Readers needing assistance should address their letters to Terry Kepner c/o Portable 100, Highland Mill, Camden, ME 04843.

DUPLEX CONTROL NEEDED

How can I change the TELCOM duplex setting from full to half from within a program? My company has a computer programmed to receive or send stories to our reporters in the field. Unfortunately the computer sends in full duplex and receives in half.

The Hermit
Westbury, NY

The difference between full and half duplex is full duplex sends what you type to your liquid crystal display at the time it's sent out the modem while half duplex sends the characters only out the modem, so you don't see what you type — unless the other computer has its echo function enabled.

Are you sure duplex is the problem? It might be echo. Echo enables one computer to send a character it's received to the sending computer to verify the character sent was the character that arrived. If both computers have echo enabled, they get stuck in a loop and send the same character back and forth. For data transmission of files, the sending computer wants to make sure the file arrived intact, hence it would have echo off and expect the other computer to have echo on. If the computer were receiving a file, the programmer would assume the transmitting computer would have echo off and turn echo on in the receiving computer. The Model 100 doesn't have that type of echo feature. Its echo function refers to echoing received characters to both the LCD and the printer port.

Before deciding you need to switch between full and half duplex, verify that you actually want to change duplex instead of implementing an echo feature in TELCOM. (On the 100, the echo feature would appear as a duplex problem, since the receiving computer would ship back the character you just typed, making everything appear twice on the display.)

What you need is a custom patch to TELCOM automatically forcing it to switch between full and half duplex (or enable and disable an echo function), depending on whether you're receiving or sending a file. I'm afraid I don't have such a patch in my files.

Your only other choice is to write a Basic program that operates in full duplex when transmitting data over the modem and in half duplex when receiving data (or switches echo off and on). In essence, you'd have to write a simple Basic telecommuncations program emulating TELCOM except for switching between full and half duplex, and enabling and disabling echo for your people with Model 100s out in the field.

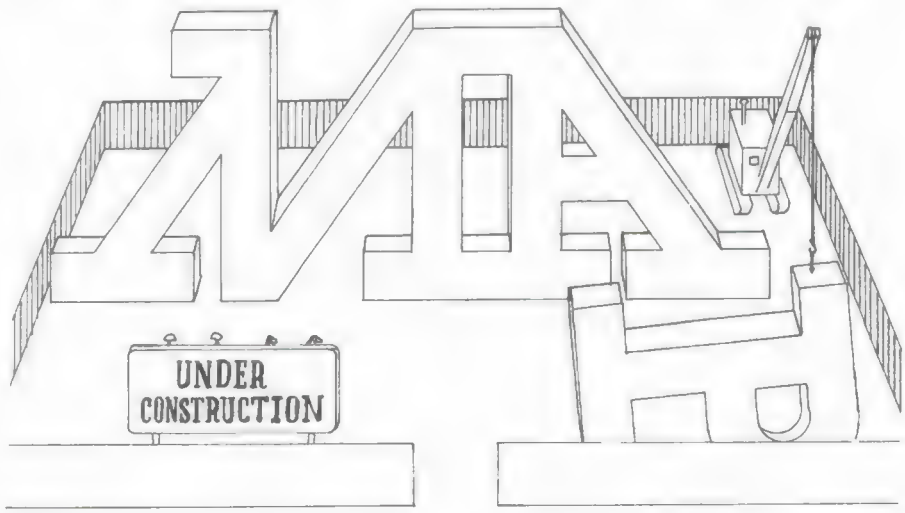
Fortunately, Model 100 Basic provides several commands using the RS232 and modem from Basic. Now all you need to do is find a Basic programmer familiar with the Model 100.

WANTS DETAILED MEMORY MAP

I'm a machine-language programmer and I want to use the Model 100's built-in ROM routines to decrease the amount of code I have to write. I also need information about how to address the different peripheral devices of the 100, such as the cassette port, display, and RS232. Where can I get a detailed memory map, and information about ROM I/O routines?

Lost in ROM
Boston, MA

At the moment there isn't a detailed memory map available for the Model 100, although several are



being developed and may be out by the time this is printed. Jake Commander is about 80 percent done with his, but how long it will take to find a publisher and get the map on the market is unknown.

Radio Shack has a team working on documenting the ROM I/O calls. When the information is available, purchasers of the 100 will receive a letter telling them the documentation is available through their local R/S store; the manual will be updated for new purchasers; and *TRS-80 Microcomputer News* will publish the information, so keep your eyes open and watch for these activities.

The documentation will be similar to the Models III/IV operations manual and will be limited to the Basic I/O routines such as: Display characters at current cursor location. Internal ROM routines will not be documented. This information should be available soon.

MODEM 1200 PROBLEMS

I have a Radio Shack DC1200 modem without the autodial feature, and I can't get it to work with my Model 100, but it does work with my Model III. Is something wrong with my computer?

No Luck Modem
Liberty, ME

The fault is with your DC1200 modem, but don't get upset: Radio Shack has a fix for the unit. Just take the DC1200 to the closest Radio Shack repair center and have it apply the required modification. By the way, this is the same modification required to make the unit work with the Color Computer, so if you have the unit modified, it'll work with both the Color Computer and the Model 100. If you get the DC1200 with autodial capability, you must set the Model 100 communications status to seven-bit words, ignore parity, and one stop bit (5711E).

TECHNICAL MANUAL FOR MODEL 100

I want to get the technical manual for the Model 100, but no one seems to know how to get one. The Radio Shack store says they can't order it because they don't have a part number for it, but I have seen it mentioned on CompuServe that such a manual has been released. What's the scoop?

Stumped
Pueblo, CO

The manual is available now. Radio Shack uses a simple method for assigning order numbers to manuals. If you want the manual for any computer, replace the dash in the hardware device's part number with a zero, and add the letters MU to the front. Hence the owner's manual for the 100 has the part number MU2603801/3802. If you want the service-technical manual, use the same method except put MS in front of the part number like so: MS2603801/3802.

HOW DO YOU USE EXPANSION PORT?

I've written a rather large applications program for the Model 100 and want to make use of the expansion ROM port of the computer. How do I get information about using this port?

Need the Room
Miami, FL

That's the big question for independent software manufacturers. At the moment the information isn't ready for release from Radio Shack. Radio Shack intends to make information about the vendor source for the ROMs, I/O support code, and instructions for linking applications to I/O support code available in the near future. The information will be furnished only to qualified prospects, after they've signed a non-disclosure agreement regarding the information Radio Shack will give them. This, of course, means the people who get this information won't be able to tell anyone else what they know without endangering their company's agreement with Tandy. Unfortunately, there are several caveat emptors on the expansion ROM.

Currently there is only one manufacturer in the world for this special ROM, Japanese, naturally. The Model 100 32K ROM is a set of four, 16K-by-four-bit, CMOS, flat-pak ROMs attached to a 28-pin DIP package.

Second, this manufacturer has a six month production lead time from the moment the code is furnished to them until the delivery of the finished ROM.

Third, the charge for making the "mask" is over $2,000, and the minimum order quantity is somewhere between 3,000 and 10,000 pieces (and each ROM costs something on the order of $40 or $50.)

So, only serious software manufacturers with sufficient investment capital to cover the initial production costs will be supplied with the ROM information.

Within a year we should see several other CMOS ROM manufacturers enter the market, and perhaps decrease the lead time and initial production cost for these special ROM packages. In the meantime, we'll all just have to put up with keeping our programs in RAM.

LANTERN BATTERY KLUGE REVISITED

I've come up with a simple solution that drastically reduces the number of batteries consumed by the computer and gives you much more time between battery replacement: six-volt lantern batteries.

I bought a DC coaxial adapter plug (Radio Shack catalog number 274-1551, $1.69), a package of insulated alligator clips (270-374A, $1.19) and some spare twin wire speaker cord. The Model 100 DC jack is center negative, so I wired the black alligator clip to the wire leading to the center of the coaxial plug, and the other wire and alligator clip to the outside. The result is a simple, 6-foot cord that plugs into my Micro Executive Work Station.

The alligator clips clamp securely onto the lantern battery terminals, making it quick and easy to change batteries. And the color coding of the two clips makes it easy to remember where to attach the clips. I bought an Everyready super heavy duty lantern battery for $3.79 — only 60 cents more than a package of four Radio Shack alkaline batteries, and it outlasts them by a considerable margin.

My AA batteries have been relegated to the job of maintaining memory when the machine is powered off, with the lantern battery

taking the brunt of the work the rest of the time.

This arrangement is especially useful when I'm writing during bad weather. I don't have to worry about the storm causing electrical problems with my computer, and I also don't have to worry about my batteries giving out unexpectedly, cutting my work time short. And when the lantern battery dies, I still have the alkaline batteries in the computer to keep me going for a while longer.

Traveling with the lantern battery is a little inconvenient, but it's worth it since I don't worry about batteries. As a matter of fact, I built several of these lantern adapter cords: one for the office, one for the car, one at home, and one with the computer.

Outboard Battery
Troy, MI

Sounds like a good idea, especially when spending long periods of time away from AC power.

MORE CORRECTIONS IN MEWS MANUAL

I have several corrections to be made in the Model 100 manual:

On page 164, the first example, line 10, is incorrect. The space between the "$" and the "=" should be eliminated.

On page 122 the explanation for the keyword LPOS is wrong. Under the title PRINTER I/O, the table entry for LPOS should read "Returns the column position of the printhead" and not "Returns the current horizontal position of the cursor."

The fourth sentence on page 188, under the heading "Sound", should read "... pitch ranges from 0 to 16383, with the larger values corresponding to lower pitches." The current sentence incorrectly states the larger values correspond to higher pitches.

Page 200, which gives a line-by-line description of the auto log-on program for accessing the Dow Jones Information Service, in the entry for line 20, the "?P" (not the "?p") should be changed from an uppercase letter to a lowercase letter. The description should be changed to read "Wait for 'p' from TYMNET."

On the same page, still on line 20, but further down, find the sentence: "Wait for a 'W' from Dow Jones. This is the first letter in PASSWORD." It should be changed to: "Wait for a 'P' from Dow Jones. This is the first letter in PASSWORD." At the end of this sentence add the following: "(Note: The complete Dow Jones computer prompt is 'Enter Password'. If you wish, you may substitute '?E' (first letter of Enter) for '?P'.)"

Helpful
Peterborough, NH

MODEL 12-MEWS COMMO PROBLEMS

I'm having problems getting my Model 100 to communicate with my Model 12. I'm using a null modem, with 5-foot RS232 extender cable. The Model 12 terminal program works with my modem, and other Model 12 computers. My Model 100 works with the modem when calling other computers over the phone, but won't directly connect to the 12. What's the problem?

No DC
Concord, NH

You're not doing anything wrong, the Model 100 and the Model 12 aren't talking to each other. (The 12 is being a snob.) It seems the Model 100 doesn't send the data terminal ready (DTR) signal required by the Model 12.(The 12 is such a stickler for protocol, don't you know). Radio Shack is aware of the problem, but doesn't know when the problem will be fixed. As a matter of fact, they say it may be some time before an answer correcting the incompatibility is available. In the meantime, you're restricted to using the modems for communicating between the two computers.

If you don't mind experimenting, you could try tying the DTR pin (20) to the DSR pin (6) and seeing if that works. (Warning: You could damage either the Model 100 RS232 board or the Model 12 RS232 board with this kind of experimentation. Do not attempt it unless you know what you're doing).

The Model 100 has no problems communicating with the Models I, II III, IV, 16, and Color Computers.

Circle No. 31 on Reader Service Card

CHATTANOOGA CHOO CHOO SOFTWARE

Track 29

Your One Stop Station For Computer Programs

BUSINESS

Skyline Software
PortaCalc - *Electronic spreadsheet with 15 column by 26 row workspace! Full use of built in function keys.*
(24K) cassette **$69.95**

*PortaStat - *statistical package*
*PortaMax - *linear programming*
*PortaFin - *loan & investment pkg.*
(24K) **$44.95 ea.**
Porta series program being released soon at **$44.95 ea.**
*PortaFolio
**interactive with PortaCalc data files*

Portable Computer Support Group
Business Pak+ includes: Write+, Graph+, Expns+, Telex+, Put+, Sort+ & a 120-page manual
6 cassettes (8K) **$119.95**

Scribe-Word Processor
Formats & prints from text files.
(8K) cassette **$24.95**

RECREATION

Silverware - *4 games on cassette*
Blockade Frankenstein Adventure
Reversi Alexis Adventure
(24K) **$24.95**

Prickly-Pear Software 10% OFF
Viking - (24K) *simulation game*
cassette ~~$19.95~~ **$17.95**
Bowling League Secretary (24K)
cassette ~~$34.95~~ **$31.45**
Football
Armchair Quarterback Strategy
(16K) cassette ~~$19.95~~ **$17.95**

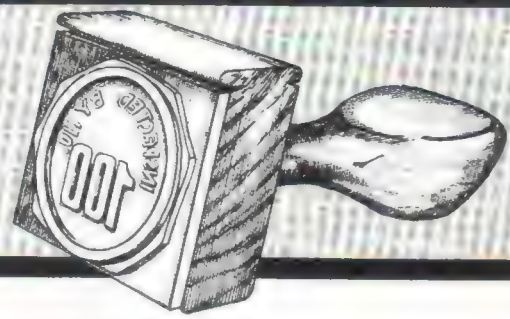
MasterCard VISA

Personal checks welcome.
Please add $2.00 for shipping.
Tennessee residents add 6.25% sales tax.
C.O.D. orders add $2.00.

Send for free complete catalog and descriptions!

(615) 875-8656
P.O. Box 15892
Chattanooga, TN 37415

REVIEWS



EXCELLENT DATA BASE FOR MODEL 100

Put+
Portable Computer Support Group
11035 Harry hines Blvd. No. 207
Dallas, TX 75229
214-351-0564
$89.95 (six programs bundled)

BY KERRY LEICHTMAN

Editor's note: For reviews of other programs in this series see September and October issues of Portable 100.

Software for the Model 100 has to use RAM economically. After witnessing the escalation of RAM requirements for other computer systems, it's refreshing to see the mega-K program trend reversed.

Put+ uses 2274 bytes of RAM. An incredibly low figure for any computer program, let alone a data-base manager, and especially for an excellent program like Put+.

Besides its slight memory requirement, Put+ makes good use of the 100's inherent capabilities: string search, text editing, and file storage.

GOOD DOCS. The documentation is well conceived and to the point. Very little is left to the imagination. As a matter of fact Portable Computer Support Group's documentation at times appears as if it is written for bunny-slope computerists. I found myself discarding many paragraphs and becoming impatient for instructional meat. Had I not been in my "review mode" I might not have stopped to think and realize why so much of my time was being wasted with elementary procedures such as, "Press play into the locked position."

Too many computer documentation books take too much for granted. Those of us familiar with setting up a tape for loading and what function key performs what task can more easily put up with over-simplified documentation than a newcomer to computers understanding instructions simply stating load, initialize, and run. I can hear the neophyte now, "Which button do I push to initialize?"

So computer buffs be warned: Only about half of the Portable Computer Support Group's docs are for you. Newcomers take heart, how to operate PCSG's programs are explained in total detail.

FORMATS. To use Put+ you first load the program. Three format screens are included on the tape; one for addresses, another for inventories, and a third for schedules. The program's screens are designed to interface with the 100's ADDRSS and SCHEDL programs. This allows you the luxury of using your Put+ files to be accessed through TELCOM for phone dialing, as well as using the other features resident in the ADDRSS and SCHEDL programs.

My first experience was with the P+ADRS file format. It used an additional 316 bytes. Darkened lines follow the field headings and there's plenty of room left for data entry.

Since Put+'s initial release, the program has gone through a number of improvements. The most notable is the method data is entered. I won't dwell on the latter version's method, which I found fault with, except to say it is worth the postage to replace it with version 1.2.

GARTH POWERS. To enter data you type the information as required by the field heading. For example at FIRST, if you were entering the name Garth Powers, you would type Garth, then hit Enter to place the cursor at LAST, and then type Powers. Hit the enter key again and you are ready to enter the information for COMPANY and so on.

When all the information has been entered for that file, press F3 to store the information. You are then presented with another blank P+ADRS screen to continue entering data. You can continue typing entries until finished and then exit the entry mode by pressing the F8 which returns you to your main menu.

Data entered in P+ADRS is placed in your ADRS.DO file where you can search using the Model 100's function keys as usual or access phone numbers in TELCOM.

WASTED RAM. Although Put+ uses the 100's memory sparingly, there can be wasted RAM in the data files. When entering data, I abbreviated as much as possible. That has become a norm for me as I am always conscious of how much memory each file will eat. Put+ did not reward me for my sometimes cryptic efforts. Once a field length has been established there doesn't seem to be any way to eliminate the extra unused field space. One entry I made

Ask your dealer for the Porta™ series from Skyline—to help you work faster and better!

PortaCalc™ — Model 100 "electronic spreadsheet" with 14 column by 26 row workspace! Full use of the built-in function keys to save, load, screen print, report print, or to look behind the data at the formulas in use.

Full arithmetic operators including exponentiation, absolute value, integer, summation, and averaging. Calculations are done to 14 digits of precision and displayed up to 9 digits. User selectable decimal place from none through seven—not just one, two, or floating! Formula replication is included to allow fast creation of worksheets.

Worksheets may be saved, loaded, or merged using the computer's memory or cassette. Often used templates can be saved in memory for instant recall.

Two powerful utility programs are included with **PortaCalc** at no extra charge! **PortaDex**™ is a data exchange program that allows reformatting **PortaCalc** files into the DIF format used by ***VisiCalc***. **PortaPrint**™ is an enhancement to the Model 100's text editor, adding the ability to adjust left, right, and top margins, and page length. Page numbering, headers, centered lines, flush right justification, new page control, and more.

Comes with extensive documentation in padded 3-ring binder. Includes tutorial, detailed reference section, and executive level sample templates. Fully illustrated with screen prints, examples, and hints.

PortaStat™ — Correlation, regression analysis, and descriptive statistics package, designed to be a working tool for today's businessman. Data can be input from cassette, memory, or keyboard. Interactive with **PortaCalc** data files! Thoroughly documented, includes tutorial.

PortaFin™ —Present value, net present value, future value, annuities, interest factors, loan constants, internal rate of return and more! This user-friendly package prompts you for the needed input data, then gives you the answer to your loan or investment problem! Interactive with **PortaCalc** files, allowing you to "read" cash flow data from memory. Keyboard or cassette input also available.

PortaMax™ — The powerful 'simplex' method of linear programming. Find the optimum 'mix' for a given set of constraints. Interacts with **PortaCalc** files to avoid time-wasting repetitive data entry. Tutorial, examples, and bibliography included.

PortaFolio™ — Stock and bond valuation, betas, Macaulay's duration, yield to maturity, bond swap calculations, and much more. All in an easy to use program, interactive with **PortaCalc** data files. Supplied with comprehensive instructions and reference manual.

PortaCalc

All **Porta** series programs are supplied on cassette and require 24K RAM.
Pricing — PortaCalc is **$69.95,** all others are **$44.95** each.
If ordering direct, add $2.00 shipping and handling per order.
Dealer inquires invited.

VISA MasterCard

Model 100 is a trademark of Tandy Corp. VisiCalc is a trademark of VisiCorp. DIF is a trademark of Software Arts.

Skyline MARKETING CORP

4510 W. Irving Park Rd. • Chicago, IL 60641 • (312) 286-0762

Circle No. 32 on Reader Service Card

only had a name, company, and phone number. The rest of the fields were blank. When I checked the file in my ADRS.DO file it was swimming in a screen of wasted RAM.

It is not really a fault of Put+, but one encompassing all the data bases I have ever worked with. On a 64K Model IV, wasted field space is less of a problem. But on a Model 100, with no disk storage, I tend to take it less for granted.

Of course there is a way to fix the wasted space. Once entering your data, go to the data file and delete as many spaces as you like, being careful not too eliminate so many as to render the entries unreadable. KERRYLEICHTMANPORTABLE100 MAGAZINECAMDENMAINE represents that extreme. But KERRY LEICHTMAN PORTABLE 100 MAGAZINE CAMDEN MAINE requires some memory saving housecleaning. The problem with deleting the spaces might occur if you use a program such as Sort+ to organize your files. When using Sort+ the information needs to be easy to locate by the program. If you eliminate spaces, the information won't be in the correct location.

EASY MODS. File format screens are easily produced and modified. Once again the program uses the 100's built-in features to its advantage. Creating a screen requires little more knowledge than normal text editing. The documentation explains the procedure exceptionally well.

The Put+ cassette comes with two other screen formats: P+ NOTE and P+INV. Information entered in P+NOTE places files in NOTE.DO, which can be accessed using SCHEDL. P+INV is an inventory screen. I named my P+INV file ARTS and use it to store information on articles sent to Portable 100 magazine. I use the file to store author, title, issue date, article pay, and a short description of what the article is about. The format obviously was not tailored to magazines, but was easily designed to accomodate my needs.

Another nice touch is Put+'s error messages. Not only are you prompted with Radio Shack's normal error codes, but you are also referred to the computer's manual by page number. For example after incorrectly entering a file name I was prompted, Error 55, see manual p.217.

Version 1.2 of Put+ is nearly flawless. With the exception of my one objection (that of wasted space), the program deserves all the praise this writer can muster. But, as stated earlier, the space problem is one inherent with all data bases I have used thus far and cannot be considered as any more than a complaint against the rigidity of data bases and not the virtues of Put+.

FORMATTING TEXT IS EASY WITH PORTAPRINT

PortaPrint
Skyline Marketing Corporation
4510 W. Irving Park Rd.
Chicago, IL 60641
312-286-0762
$44.95

By WOODY LISWOOD

PortaPrint is the third of a series of programs by Skyline Marketing designed for the Model 100. PortaPrint gives you an alternative to printing your text using the built-in print routines of the Model 100.

Although the Model 100 is a great machine, the built-in print routines are just not up to standard. You should be able to set a series of default values for your printed page rather than only line length.

My greatest frustration was not the lack of word-processing capabilities, but the absence of line feeds with carriage returns. That meant I had to change all of my printers to send a line feed each time they saw a carriage return — a major pain considering every program I use requires just the opposite.

PortaPrint solved that problem. It gives you the option of adding a line feed if necessary. For no other reason, you should have this program as part of your library.

DOCUMENTATION. PortaPrint's documentation is clear and easy to understand. It reviews the program's prompts, discusses each choice, and gives you some examples of replies.

You transfer the program from cassette to the 100 and let it reside in RAM ready for use. When you run the program, it displays the files you have in memory, then queries you for some response.

PROMPTS. The first prompt is MARGIN LEFT? Many folks advise not to print your documents from column 0 to column 80 on your printer. I normally use an 8-character offset for the left margin and a 10-character offset for the right margin.

The next prompt is RIGHT? My choice was 70. If you have a daisywheel printer with a 12 or 15 pitch option or dot matrix with compressed type faces, you will appreciate this feature.

TOP? How far from the top of your page do you want printing to start? I normally use 10.

LINES/PAGE? How many lines do you want to print on your page before PortaPrint issues a form feed? I normally use 55.

PAGE #? lets you start your page numbering where you want. If you set it to zero, you will not get any page numbers.

HEADER? is best quoted from the documentation. "An entry to the Header? prompt will print left justified at the top of the second and following pages if the page number is set to print."

LCD OR PRINTER (L/P)? lets you direct your output to the screen or to your printer. If you are not sure how your document will look, you can send it to the screen and view it. Within the limits of an 40-column screen, you can see where the lines and the pages will break, as well as where the header will fall and the page numbers will print. If you have ever used Spellbinder, you will find this function works the same way as its view function.

If you select the LCD display, you go directly to the file name request. If you select the printer, you go to a line feed request.

LINE FEED (Y/N)? Do you want the Model 100 to send a line feed as well as a carriage return at the end of

"There's No Time Wiser Than After Dark."

When you're looking for solid, up-to-the-minute information, the best place to search is BRS/AFTER DARK. The one system designed for serious searchers, AFTER DARK offers you more databases citing more authorities on more subjects than any other popular online information service—at the lowest cost.

For only $6 to $20 per connect hour, including telecommunications charges, you can personally access the same online files used by major reference libraries and corporations worldwide. These files contain the latest information on subjects ranging from business management, mathematics and education to health, psychology, chemistry, family planning, and just about everything in between.

The range of databases available keeps expanding all the time. AFTER DARK now brings you the full text of the **Academic American Encyclopedia**, as well as the **Harvard Business Review.**

And for microcomputer buffs, there's a new online Software Directory listing major software packages.

AFTER DARK's simple, interactive language and straightforward logic take only minutes to master. The system is outstandingly comprehensive, remarkably fast, and above all, fun to use. All you need is your classified BRS password and any dial-up system. Then, every weekday from six in the evening until the early morning hours—round the clock on weekends and holidays—you can summon up a wealth of valuable information.

Use the coupon to sign up for BRS/AFTER DARK before another evening goes by. Seriously, it's like having your own university library online at home.

BRS COLLEAGUE
AFTER DARK

Circle No. 33 on Reader Service Card

☐ Sign me up as a BRS/AFTER DARK subscriber. I understand I will be charged a one-time subscription fee of $50 plus connect hour rates as low as $6 per hour, billed to my credit card account with a monthly minimum charge of $12.

☐ I'd like to know more. Please send me a list of databases and a brochure describing BRS/AFTER DARK.

My profession is _____.

Mail to BRS • 1200 RT. 7 • LATHAM, NY 12110 • (518) 783-1161

Name _____

Address _____

City _____ State ____ Zip ____

Charge to MASTERCARD/VISA (circle one).

Acct. No. _____

Expires _____

Signature _____

First came the TRS-80 Model 100 Portable Computer

Now Comes *PORTABLE 100* Magazine

your expert guide to the power, the promise and the potential of the Model 100!

Every issue, add to your computing know-how; improve your programming and operating technique; increase the value of your Model 100 to your business and personal computing with articles and features like these:

- **Free Programs**
- **Hardware and Software Reviews**
- **Communications**
- **CompuServe and Database Information**
- **Applications for Business**
- **Games and more!**

PLUS these incisive columns, every issue!

TANDYLINE — will keep you up-to-date on new product developments at Tandy, new and helpful peripherals for the 100, and events that may affect you as a 100 user.

BASIC — a full column devoted solely to tips and techniques of BASIC programming.

MODEL 100 SIG — news and chatter about the Model 100 Special Interest Group.

FINANCIAL ANALYSIS — offering expert help on how to use your 100 as an investment tool and other aspects of financial management.

FEEDBACK — a Q.-and-A. column that responds to your needs, including some things Tandy may not tell you.

TO ORDER, complete the attached order card, or if card is missing, the coupon at right, and mail today to enter your Charter Subscription to ***PORTABLE 100*** and the new, portable computing era!

PORTABLE 100 The magazine for Model 100 users

Detach Here. Mail This Portion Today.

Charter Certificate

PORTABLE 100 • **PO Box 468** • **Hasbrouck Heights, NJ 07604**

YES! ENTER my no-risk Charter Subscription at the money-saving rate of just $24.97 for 12 monthly issues. I save $10.43 off the cover price. If not satisfied, I may cancel at any time and receive a full refund of the unused portion without delay.

☐ Payment enclosed. ☐ Bill me.

Name _____

Address _____

City _____

State _____ Zip _____

each line. As I said before, I think this question makes the program an important addition to my library for the Model 100.

FILE NAME? is the last request. What file do you want printed?

PRINTER CONTROLS There are three imbedded commands in PortaPrint to help format your text. Most formatting programs I have worked with use dot commands — that is a period in the first column of a line followed by a letter or two to let the program know what you want to do. PortaPrint, however, uses control codes entered by using the up caret followed by a letter.

<Up Caret><F> will start a new page. It lets you break a page wherever you want.

<Up Caret><C> will center the next line of text.

<Up Caret><R> will cause the next line to be right justified.

Some advice about paragraphs: If you want them indented, you should use the spacebar rather than the tab key.

PortaPrint is that easy to use. It worked well and did not crash during my tests. It will be my choice to print text as long as I need line feeds for my printers.

INTERFACE CALCS WITH PORTADEX

PortaDex
Skyline Marketing Corporation
4510 W. Irving Park Rd.
Chicago, IL 60641
312-286-0762
$44.95

By WOODY LISWOOD

PortaDex, by Skyline Marketing, works with PortaCalc, a miniature "calc"program for the Model 100. (*Portable 100*, October 1983, page 17). PortaDex will take a file created by PortaCalc, transform it to a DIF file (the format used by VisiCalc for sharing files with other programs), and send it to the computer of your choice.

Stop. Think. That means if you have a Model 100, you can create calc files while you are on the road, then transmit them to a larger computer to a program reading the DIF standard. That also means you can create calc data sets or even data base fields in your little 4-pound wonder.

The key, then, is does it work? Yep, it sure does. I tested it in two types of operations. First, I created a salary planning model to use in my consulting practice. Then, I transmitted it to a SuperCalc model in my Osborne Executive. No sweat.

WORKS WITH PC. You should also be able to use the same procedure and upload to an Apple or an IBM PC, then load the DIF file into DB Master. Of course, if you use Selector or dBASE, you can always upload the DIF to SuperCalc. Then you could have SuperCalc convert the file into a comma-delimited ASCII file and have your favorite data base read that file. You can see why the PortaDex program is a must program for your Model 100.

The documentation I received was printed with, what looked like to me, an Epson MX80 or equivalent. The letter said the future documentation would be typeset. It was easy to read, gave some good examples, and did not seem to belabor the obvious.

The program was received on cassette. It loaded first try. By the way, when I followed Skyline's instructions about setting the volume level between two and three, I could not get my recorder to read the end of file marker on the tape so the program would not load. When I used the settings I normally use, about five, the tape loaded directly. If you have trouble loading, increase the volume level before you give up.

THIN MONSTERS. The DIF files created by PortaDex are long thin monsters. There probably isn't enough room in the Model 100 for them, so the program sends them directly out the RS-232 port.

I use the Model 100 to communicate with my Osborne. I set my stat parameters at 37E1E. I use 300 baud because XON/XOFF does not seem to work, so I have to give the computer plenty of time to capture data.

On the Ozzie side, I use a program called Move-It. It specializes in computer-to-computer, direct-connection communications. It has a capture buffer of around 49,000 bytes on the Ozzie, so I don't have to worry about being sent more than can be received prior to an XON/XOFF command being given. I use a standard RS-232 cable with lines 2 and 3 crossed.

After creating a financial model with PortaCalc and saving the model to RAM, run TELCOM and set up the appropriate stat configuration. Check your other computer and make certain it and the 100 are communicating properly. When you are certain of that, you should initialize the capture buffer of the receiving computer.

CP/M TIP. If you are sending to a CP/M-based computer and you do not have an intelligent terminal, you might try this command: PIPXXX XXXXX.XXX=RDR:[B]. This, according to an article I recently read, will tell PIP to create a disk file containing all of information it is going to receive through the modem port until PIP receives an EOF marker. The XXXXXXXX.XXX is the name and extension of your new file.

When you run PortaDex, you will be shown a list of files currently residing in RAM. PDEX.BA should have an * after the name. That shows you PDEX.BA is the current active program. Key in the name of the file you want transmitted.

PortaDex reads your file, then displays the extent of the rectangle containing your data. You are given an option to specify both the upper-left-hand cell address and lower-right-hand location. A return means send the entire model.

When everything is completed, PortaDex returns you to the Model 100 main menu.

If you own a Model 100, you were probably very happy with the text editing, but unhappy there was no calc program to use. That is now changed. The PortaCalc-PortaDex combination makes this small machine a valuable acquisition. You can now work on the road, at home, at the office, or at the beach, and know that no matter what you do, you will be compatible with a large group of business related programs.

NEW PRODUCTS

SEATTLE FIRM OFFERS EIGHT MEWS PROGRAMS

Traveling Software Inc., 11050 Fifth Ave. NE, Seattle, WA 98125, is offering eight business-oriented programs for the TRS-80 Model 100. Each sells for $59.95.

PROJECT MANAGER. The Traveling Project Manager is a daily management tool. It allows for budget and actual information to be managed by work activities, individual tasks within an activity, and detailed expense accounts. Estimated completion dates for both tasks and activities can be recorded. Critical activities affecting the overall completion schedule of a project may also be indicated.

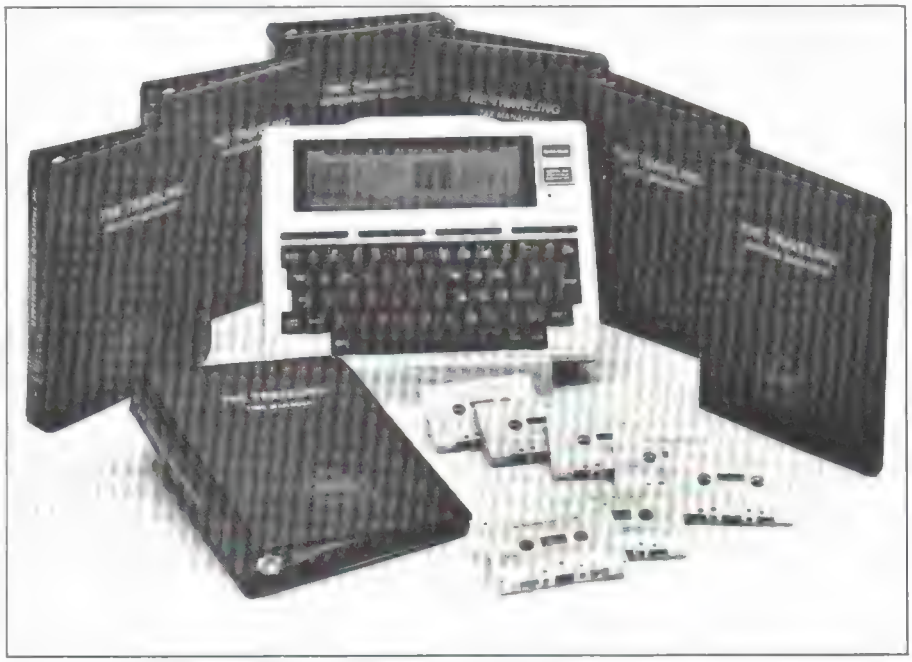
TRAVELING ACCOUNTANT. The Accountant can be your traveling bookkeeper providing a true double-entry accounting system. It can record transactions generated away from your home or office and process them immediately. Journal entries may also be transmitted using another Traveling Software program, The Communicator, to your office computer system. In addition, the program has several report options including the generation of complete financial statements.

TAX MANAGER. The Traveling Tax Manager provides an easy-to-use tool to assist in the annual chore of preparing the dreaded 1040 form. It will guide you through 1040 line by line and will provide alternative cost saving calculations such as income averaging. As a registered owner of the program, you will receive four quarterly tax newsletters during the year of purchase. The Traveling Tax Newsletter is prepared by a practicing tax attorney and CPA and contains valuable updates and suggestions concerning current tax issues. Traveling Tax Manager will be updated each tax year and previous registered owners will be able to obtain updated versions at a reduced cost.

TRAVELING COMMUNICATOR. This program provides a compatible link between your office or home computer system and your 100. It is designed to work with files generated by The Traveling Business Manager series as well as files generated by other programs. To use The Communicator, you select the items of information you would like to transmit to another computer, specify the format your computer is partial to, and then send your information off via a phone line or direct cable connection.

THE TRAVELING TIME MANAGER. The Traveling Time Manager provides a complete professional time management and billing system. Time expenditures may be recorded for both projects and clients as well as by work activity. Hours worked may be identified as either nonbillable or billable. Standard billing rates can be automatically applied to individual work activities. It is also an effective way of managing the hourly usage of equipment and machinery.

APPOINTMENT MANAGER. The Traveling Appointment Manager is an easy-to-use tool that helps you to keep track of scheduled appointments and daily activities. Appointments may be entered by either a specific date or by a day in the week such as "the second Monday in December." The Appointment Manager can automatically remind you before a scheduled appointment time. Missed or changed appointments are easily rescheduled. The Appointment Manager also allows you the option to create a daily prioritized list of tasks to accomplish. Appointments or tasks pending may be viewed on the display, or schedules may be printed.



SALES MANAGER. The Traveling Sales Manager is an effective tool for managing daily sales related activities. It keeps track of both customer and product information and provides a complete customer order entry system. It even offers an optional "reminder" service for follow-up customer contacts or other pending customer business. The program can also be used with The Communicator to transmit sales information directly from the field to your office computer system.

EXPENSE MANAGER. The Traveling Expense Manager provides an easy way of keeping track of expenses while you are traveling. Expenses may be entered in categories you define as well as optionally being recorded within a project or client classification. The program can also keep track of expenses by various sources of funds such as cash, checking accounts, or credit card accounts. Current balances or each account and cumulative expenses may be viewed on the display or optional reports may be printed.

FINANCIAL PACKAGE BY HAWKEYE FIRM

York Software, 2885 Tanglefoot Lane, Bettendorf, IA 52722, is marketing a financial analysis package for $39. Offered in versions for 8K and 16K Model 100s, the package provides for calculation of loan amortization, annuities, bond analysis, and compound interest. It employs the use of more than 20 screens. The package comes with a 23-page, comb-bound manual.

BURST FROM YOUR GRAY FLANNEL STRAIGHTJACKET

Owners of 24K Model 100s can be more than a business machine with two game packages from Silverware, P.O. Box 21101, Santa Barbara, CA 93121. Each package costs $24.95. Games # 1 package includes:

- Blockade, where your snake grows larger as you hit random targets on the screen and try to avoid hitting anything else;
- Reversi, an Othello style game;
- Frankenstein Adventure, where you walk around a graveyard and search an old house to find the secret of awakening the monster; and
- Alexis Adventure involving sailing the seas, landing on islands, battling an old foe in real time.

In the Games #2 package, you can play:

- Amazing Chase, avoiding two pursuers in a random maze;
- Maximum, where you must get squares worth 1 to 64 points while blocking your opponent from getting a high-point square;
- Checkers, playing your computer, a human opponent, or the computer playing itself; and
- Williamsburg Adventure, where you wander through this colonial city in search of a golden horseshoe.

COLOR GRAPHICS AND FULL-SIZE DISPLAY FOR 100

If your 100 seems to be a miracle machine now, wait until it has color graphics capabilities.

According to Andreasen's Electronics, 1548 Monterey St., San Luis Obisbo, CA 93401, its Mikrokolor Color Graphics Interface is designed to provide the Model 100 with high resolution color graphics and text capability using a standard color monitor or television.

The interface is sold fully tested and assembled for $235 or as a kit for $195.

Mikrokolor has 256-by-192 color graphics with 15 colors plus transparent. It has four modes:

- Text, with 24-line-by-40-character display using a 6-by-8 dot matrix with 256 characters that can be defined by a user;
- Multicolor, with 64-by-48 color graphics;
- Graphics, with 256-by-192 color graphics, 24-line-by-32- character display in 8-by-8 matrix, two colors per character; and
- Graphics2, providing easily programmed graphics animation capability for business displays, graphs, charts, or games.

The unit, with a modulator, can be used with a standard color or black and white TV.

No hardware modifications are needed, according to Andreasen. The video display processor in the unit, which has 16K of RAM, doesn't use any of the 100's memory.

Mikrokolor comes with a manual and software for text translation to 24-line monitor with auto scroll and cursor control, color graphs, and business applications.

SPECTRUM AND HOLMES OFFER 8K RAM UPGRADES

Spectrum Projects, 93-15 86th Drive, Woodhaven, NY 11421, and Holmes Engineering Inc., 5175 Green Pine Drive, Murray, UT 84107, are offering 8K RAM memory upgrades for the Model 100. The upgrades plug into existing sockets in the 100 and require no modifications of the system. Spectrum's upgrades cost $79.95 each plus $3 shipping; Holmes's $75 each, $70 each for two or more.

MORE PROGRAMS FROM DALLAS GROUP

THE Portable Computer Support Group, 11035 Harry Hines Blvd., #207, Dallas, TX 75229, has announced seven more programs for the TRS-80 Model 100:

DATA+. This $59.95 program makes the 100 virtually a true data base. You can have up to 16 data fields.

With Data+, you can search on a field and edit records on the screen. At the press of a function key, you can print mailing address labels, list any record or field in columns or other configurations. You can also pause between labels and set left margins.

With Data+'s merge function you can automatically print any field of any record into a form or letter.

The program gives you full search and selection capability. You can

find and print just one record or a range of your choice.

Data+ also remembers your favorite formats, allowing you to quickly default to them with the enter key. And it has a "build" feature, letting you build and print a report file of unrelated records that could not be selected as a group alphabetically or numerically.

TYPE+. This program turns your 100 into a feature-rich, electronic typewriter. You can send what you type directly to paper or set a print delay of from one character to the last line of your material. Other Type+ features include using the function keys to set centering, margins, and tabs; audible end of carriage; automatic carriage return and advance of paper; and backspace and overstrike (if your printer responds to backspace commands).

Everything you print is stored simultaneously in a RAM file, formating exactly as you composed it on the paper, ready for reprinting or editing in the file.

Type+ also sells for $59.95.

TUTOR+. Using a games approach, this $29.95 program teaches keyboard skills. It works on a space invaders principle, forcing you to become proficient at manipulating the 100's keys. You shoot down enemy ships and keep supply lines activated using your keys to fire and fuel. And while you play, you learn to touch type.

SORT2+. This is a low memory sort program to supplement Sort+ in Businesspak+. Sort2+, selling for $29.95, sorts a file in place. It consumes only 1K of memory while sorting any Put+ or Data+ file in RAM. Sort+ requires more memory and allows you to sort from cassette. Sort2+ has upper case fold, meaning it ignores whether an entry you are sorting is in upper- or lowercase. It also has true numeric field sort, which means numbers don't have to be written 00001.

TENKY+. This program lets your 100 emulate a 10-key desk calculator. The right hand side of the screen represents the tape, which can be sent to a file or printer. Three memories are visible on the left of the screen and can be recalled at the touch of a key.

This $59.95 program also features an amortization function, where the computer requests interest rate, principal and term, displays the payment, and prints a schedule. Other functions include IRR, future value, effective interest rate, depreciation, and present value.

All of these features are in addition to the normal functions associated with a 10-key desk calculator, plus annotation of any item of the tape (up to 26 characters).

WAND+. Costing $49.95, this program adds bar-code reading capabilities to Data+. It uses a Hewlet-Packard wand and reads UPC, 3 of 9, and Plessey codes. It includes Data+ interface.

LOGON+. This program allows telephone communication with IBM, Honeywell and other mainframes; true electronic mail. Each application has its own parameters, so prices vary.

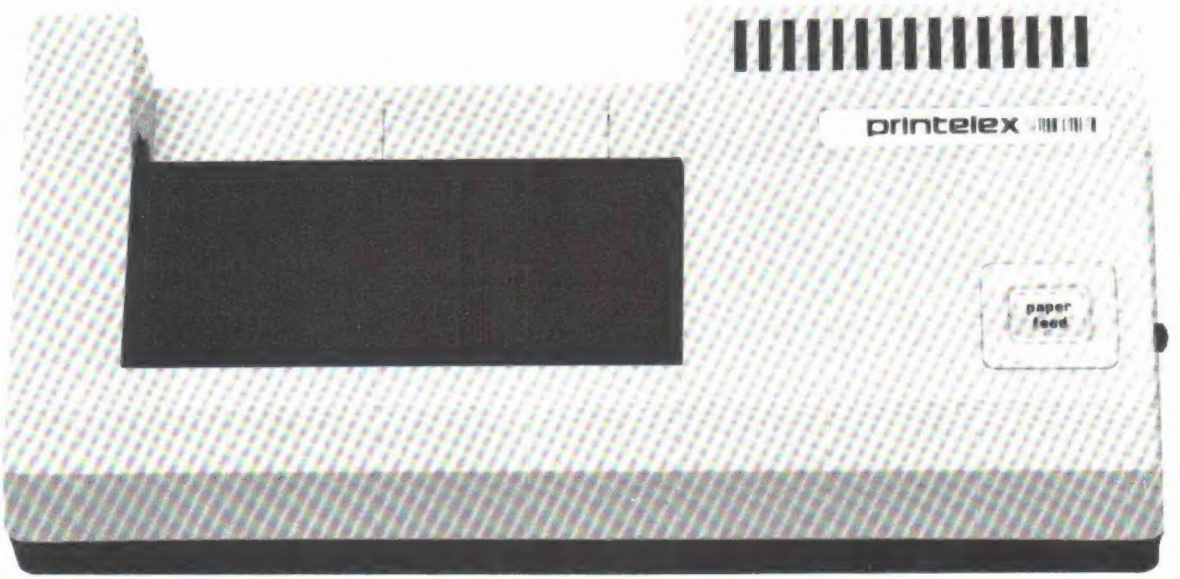
WRITE+ 2.0. This enhanced version of the Businesspak+ Write+ program takes up only 3.5K of memory and has a number of new features: optional end of document page feed, optional line feed between paragraphs, two spaces allowed after a period, improved error checking of W+SPEC file, improved communications to other computers (formatted files go directly to CRTs), CORTIN.CO no longer shows on menu, and global printer control can be set in W+SPEC file.

For Businesspak+ owners, the Write+ upgrade can be ordered for $15.

Advertisers' Index

PAGE	RS No.	ADVERTISER
49	29	Alpha 100
35	19	Alpine Data Systems
CVR IV	38	American Micro
1	2	Andreasen's Electronics
29	12	Arcsoft
63	36	Atlantic Northeast
19	10	Bi-Tech
57	33	BRS
53	31	Chattanooga Choo Choo
7	37	Citibank
43	23	Complete Computer Services
48	28	CompuSoft
50	30	Delphi
29	13	DFW
37	21	Fort Worth
21	11	Holmes Engineering
31	16	Iota
13	9	Kangaroo
30	15	Key Solutions
44	25	Menlo
6	6	Micro Computer Services
39	22	Micro Management
6	5	PG Design
30	14	Pocket Programs
5	4	Portable Computer Support Group
9	8	Purple Computing
32	18	Radio Shack
15	—	Silverware
CVR II	1	Skyline
55	32	Skyline
37	20	Solitary Software
45	27	Stephens
3	3	Telesoft
CVR III	7	Travelling Software
31	17	York Software
44	24	York 10

printelex



A compact, portable, slimline printer ideal for the...

- **TRS-80 Model 100**
- **Texas Instruments 99/4A**
- **Commodore, Atari**
- **and many other computers and terminals**

Quiet **160** cps operation with graphics capability. 40-column thermal printing with switch selectable Baud rates from 110 to 4800.

Comes with **both** Serial RS232 Asynchronous and centronic parallel interfaces. Use also with instrumentation and communications devices.

Dimensions: **9 1/4" x 4 1/4" x 2 1/4"**
9 1/4" x 6 1/8" x 3 1/2" *(with paper roll)*

Prices:

printelex	**157.50**
paper *(2 rolls)*	**9.95**
cable	**24.99**

Prices include shipping

OEM and Dealer inquiries welcomed.

See the printelex along with the latest products from SHARP, EPSON, and SUMICOM at our booth at the Northeast Business Computer Show - Nov. 17-19.

ATLANTIC NORTHEAST MARKETING, INC.

P.O. Box 921 • Marblehead, MA 01945 • (617) 639-0285

KERRY LEICHTMAN

END TRANSMISSION

NOW'S THE TIME FOR ALL GOOD PERSONS TO GET INTO SUPPORTING THE 100

Marketing projections for microcomputer and software sales abound in the pages of news and trade journals. Everyone presents different numbers for projected growth in sales. The one aspect these articles have in common is staggering predictions for increased sales from year to year throughout the remainder of this decade.

Everyone has their own interpretation of staggering. Let me define mine by using a rather simple scale. An increase by the millions would be exciting; the hundreds of millions, incredible; billions *is* staggering. It seems computers have rabbits beat.

KING PORTABLE. Now that the industry has started to accept staggering growth as the expected norm, the focus has shifted to an attempt at calculating which segments will produce the greatest amount of consumer attention. Many experts are pointing that golden finger of fate at portables. A recent *InfoWorld* article predicted portables will represent a majority share of the computer market by 1987: "Two out of three microcomputers sold worldwide will be portables by 1987," the article began. If the report is wrong it is probably wrong by placing the projection too far in the future. Portables may dominate the market even sooner.

Few experts argue against the view Tandy's Model 100 represents the best portable available today. What the future holds for Tandy's state-of-the-art lead in portables is anyone's guess. Intelligent analysis, coupled with historical studies, should prove Tandy is sitting on a keg of profitable dynamite. Everyone plays catch-up, while Tandy works on what they'll have to catch up with next.

It's true Tandy's future competition will be more sophisticated than what it faced in the late 1970s. Their portable computer dominance will not go unchallenged by IBM, Apple, and others not yet heard from. Keep in mind that even with all the hype and attention given to cut-rate upstarts such as Commodore and TI, Tandy has maintained a strong third place standing in overall market share. And with companies like Commodore and TI quite literally giving their computers away, Tandy will have greater profits to draw on, enabling them to spend more on research and development and other costs necessary for maintaining their technological lead.

IBM: PORTABLE LEADER? The fact IBM will probably roar in and grab first place in the portable market just as they did in desktops actually works out for the better. Today if you want to cash in on the IBM market explosion and write that perfect word processor, compiler, accounts package, or whatever, you'll be entering a standing room only arena. Look at *PC Magazine* to get an idea of the type of marketing investment required just to get noticed.

This is not to say products for the PC are not profitable; they are, but where there is intense competition there is intense risk of being on the losing side. Never forget that in every game someone has to lose. To your competition, you are the someone else.

Software and hardware peripherals for the Model 100 have been appearing slowly but surely. If you have an idea, don't sit around and wait until someone else comes out with it; do it yourself. How many times has something come onto a market leaving you muttering to yourself how you'd thought of the very same thing a year ago? The earlier you enter a market, the less crowded the arena is, and the better chance you have of firmly planting yourself onto the ground floor of the same profitable pile of dynamite that Tandy is sitting on.

NEXT.100

After reading Jake Commander's articles on the 100's ROM, you might ask yourself, "How does he do it?" Next month, you're going to find out when we publish Jake's ROM disassembly program.

For last minute Christmas shopping, you can't beat a computer. And Bill Louden will tell you how to avoid the holiday season crunch by shopping on CompuServe.

For the artistically minded, Richard Ramella will show you how to turn your 100 into a sketch pad, while David Busch will show you how to turn it into a most expensive Etch-A-Sketch.

So make your holiday season a joyous one and join us in December.

Circle No. 7 on Reader Service Card

TRAVELING SOFTWARE.

FOR PEOPLE WHO ARE GOING PLACES.

TRAVELING SOFTWARE, INC. is a leader in providing innovative, efficient, easy-to-use software products for notebook/briefcase size computers.

If you are thinking of purchasing a notebook or briefcase size computer, ask your dealer if Traveling Software is available for it, or call our Consumer Support Division at: (206) 367-8090.

THE BUSINESS MANAGER SERIES

- The Traveling Appointment Manager™
- The Traveling Expense Manager™
- The Traveling Time Manager™
- The Traveling Sales Manager™
- The Traveling Project Manager™
- The Traveling Accountant™
- The Traveling Tax Manager™
- The Traveling Communicator™

Only $59.95 each

TRAVELING SOFTWARE™

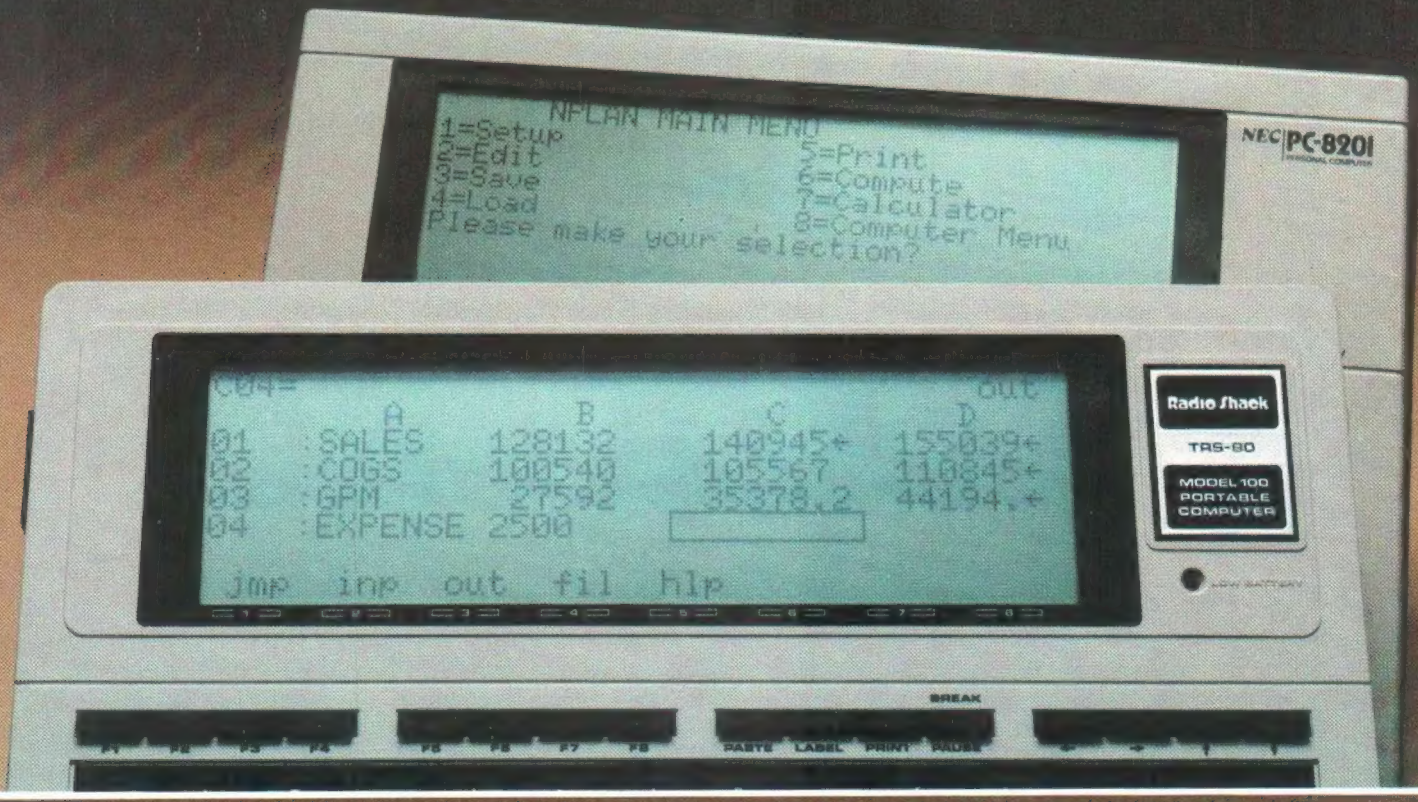
TRAVELING SOFTWARE, INC.
11050 FIFTH AVENUE NE
SEATTLE, WASHINGTON 98125
(206) 367-8090

"FOR PEOPLE WHO ARE GOING PLACES"™

CHECK OUR FULL-FEATURE SPREADSHEET.

AMERICAN CALC
For Your Radio Shack TRS-80 Model 100/NEC Model PC 8201A

- ☐ *Handles up to a 30 × 26 matrix.*
- ☐ *Cursor movement is left, right, up, down and go to any location.*
- ☐ *Program is capable of addition, subtraction, multiplication and division.*
- ☐ *Insert or delete rows or columns.*
- ☐ *Replicate numbers or formulas.*
- ☐ *Copy, save, load and screen dump.*
- ☐ *Built-in calculator.*
- ☐ *Shipped with bound instruction manual, pre-recorded audio tape and vinyl album case.*



Write for free catalog listing additional Model 100/8201A business and engineering programs.

Circle No. 38 on Reader Service Card

ampi

American Micro Products, Inc.
705 North Bowser
Richardson, Texas 75081
(214) 238-1815